THE ROLE OF GENDER SOCIALIZATION AND SIBILANTS IN THE PERCEPTION OF GAY- AND STRAIGHT-SOUNDING VOICES: A STUDY OF RETURNED LATTER-DAY SAINT MISSIONARIES IN UTAH

by

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ABSTRACT

This study explores the roles that gender socialization and the acoustics of [s] play in the sociophonetics of perceived gay and straight speech. There have been two main approaches to the study of why some men sound gay and some sound straight: acoustic and social reasons. Many sociolinguistic studies have focused only on the phonetic cues utilized in sounding gay or straight, or on cues listeners use to judge someone as sounding as such (Jacobs et al. 2000; Piccolo 2008; Zimman 2010). In previous studies (e.g., Jacobs et al. 2000; Munson et al. 2006; Zimman 2010), the phonetic variable [s] has been found to be the best acoustic cue for differentiating between gay and straight speech.

Studies (Gaudio 1994; Linville 1998; Munson et al. 2006) that have explored social reasons as to why men are perceived as sounding gay or straight have argued that self-identified sexual orientation as well as membership in a larger gay or straight community may influence perceptions of speech. Only one study (Renn 2002) has focused on how gender socialization influences judgments of men's voices as sounding gay or straight.

Fourteen self-identified gay and straight Latter-day Saint returned missionaries were recruited as participants in a sociolinguistic interview, which resulted in the collection of demographic information as well as approximately one-hour audio recordings of three different speech styles (two reading styles and spontaneous speech). These speaker-participants also completed the Kinsey Scale (Kinsey et al. 1948) to determine sexual identity and a psychometric recalled childhood gender socialization questionnaire (Zucker et al. 2006) used to determine childhood activities and habits. Short samples from the interviews were used in a subsequent matched guise study where listener-participants were asked to judge the speech samples as sounding gay or straight along a five-point Likert scale.

Four acoustic properties of [s], highest peak frequency, highest amplitude, spectral center of gravity, and spectral skew; actual orientation; style; and the results from the childhood gender socialization questionnaire were analyzed using a mixed effect model of statistics to determine their effects in the judgment of a voice sample being perceived as sounding gay or straight. The results showed that those speaker-participants who had lower scores on the recalled childhood gender socialization questionnaire were more likely to be judged as

sounding gay while those who had higher scores were more likely to be judged as sounding straight.

Speaker-participants were judged as sounding significantly "straighter" when reading the scientific reading sample as opposed to the dramatic reading or when speaking spontaneously. The highest amplitude and spectral skew measures yielded significant results but in the opposite direction that was hypothesized. Those with a lower average skew and average higher amplitude in [s] were judged as sounding straight, those with a higher average skew and average lower amplitude were judged as sounding gay. Results counter to Jacobs et al. (2000); Munson et al. (2006); Zimman (2010, 2013) may be the result of participant outliers or may actually be a phenomenon that is unique to the Mormon male population.

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CHAPTER 1

INTRODUCTION

This thesis combines sociophonetic and psychometric methods in order to explore the relationship between childhood gender socialization and the perceived speech of gay and straight young adult males. There has been great controversy as to how one should describe someone who does not identify with the heteronormative binary sex, gender, and sexuality categories. Over the years, the term LGBT (i.e., Lesbian, Gay, Bisexual, Trangender) has been a sort of catch-all umbrella term for anyone who identifies within this group. The problem is that LGBT does not encompass the wide spectrum of gender and sexual identities. It is not within the scope of this work to add dialogue to the controversy of sexual and gender identification. For the purposes of this thesis, I use the terms *gay* and *straight* (as well as *lesbian*, *bisexual*, and *trans**) as a noun to refer to anyone who self-identifies as such, which is in line with how my participants self-identified, at the time of the study. I use the terms *gay-sounding* and *straight-sounding* to describe the perceived speech of all participants, despite their self-identification. I will use the term LGBT to describe the larger group of people who do not not identify with the heteronormative binary sex, gender, and sexuality categories, which includes but is not limited to, lesbian, gay, bisexual, trans*, intersex, queer, questioning, asexual, pansexual, sapiosexual, two-spirit, etc.

The presence of an LGBT community within mainstream American culture is more visible than it has ever been. With pop-culture television shows that feature gay characters in lead roles, such as *Will and Grace*, *Modern Family*, and *The New Normal*, more and more Americans are being exposed to this subculture in America. Legislation related to marriage and adoption equality among other policies and laws in relation to the LGBT community have been rapidly changing over just the past couple of years. Not only is this change happening nationally with the Defense of Marriage Act having been struck down by the Supreme Court of the United States, but a ruling by Justice Robert Shelby of the United State District Court for the District of Utah made it legal for LGBT to be married, in December 2013; as of June 25, 2014 the 10 Circuit Court of Appeals affirmed the district

court decision after the State of Utah appealed the ruling by Justice Shelby in Utah.

An LGBT community and its supporters within The Church of Jesus Christ of Latter-day Saints have recently made their presence more visible within the past few years, with conferences like "Circling the Wagons" (Peffer 2014) that have catered specifically to LDS LGBT and their friends and family, the emergence of a student group for those with "same-gender attraction" at Brigham Young University, which is owned and operated by The Church of Jesus Christ of Latter-day Saints, as well as a large LDS presence during the Utah Gay Pride Parades, in 2012, 2013, and 2014 (Mormons Building Bridges 2014). The emergence of this once invisible community has made it easier to recruit self-identified gay LDS to participate in this study. By tapping into these intersections of identity and restricting their geographical boundaries, we can better understand how gender socialization influences how one is perceived, based solely on one's speech.

This thesis is based on data collected in two smaller studies: namely, a production/interview study, which utilized sociolinguistic-style interviews (Labov 1972), and a language attitudes and perception experiment. In the first study, 14 self-identified gay and straight males, who will be referred to as speakers participated in an hour-long sociolinguistic-style interview that collected demographic information as well as two types of read speech and spontaneous speech, which resulted in three styles of spoken speech; the 14 participants also participated in a psychometric recalled childhood gender socialization survey to determine their childhood activities and habits and affirmed their sexual orientation by completing a Kinsey Scale (Kinsey et al. 1948).

Earlier studies suggest that [s] may be a good indicator as to whether a voice is perceived as sounding gay or straight (Linville 1998; Jacobs et al. 2000; Levon 2006, 2007; Munson et al. 2006; Zimman 2010, 2013), although these studies contradict each other and do not agree in what way [s] actually may influence the perception of speech. My acoustic analysis focuses on four characteristics of the sibilant [s]: highest peak frequency, highest amplitude, spectral center of gravity (also known as mean frequency), and spectral skew. Spectral skew, according to Munson et al. (2006:215) describes whether the majority of energy falls above or below the median frequency in a sibilant. As these previous studies have found, gay men tend to have more negatively skewed spectra, or more energy above the median frequency.

Portions of the audio data from the sociolinguistic interviews in the first study were used in a subsequent language attitudes and perception experiment to determine the perceived sexuality of each of the 14 voices. A second group of participants, or listeners, were recruited

to participate in a 40-minute perception study where they were asked to listen to thirty second excerpts from the sociolinguistic interviews and judge the voices they heard across five characteristics using five-point Likert scales.

My analysis explores how these acoustic properties along with childhood gender socialization relate to each of the voices from the perception experiment as being judged as sounding gay or straight.

In the next chapter, I will review the literature on language and sexuality and how it relates to this thesis. I then state the questions this thesis will attempt to answer and my hypotheses about gender socialization, style, and the acoustics of [s]. Chapter 3 will discuss the methodology of the two studies. I begin by discussing the speakers that participated in the study, the interview process, and the administration of the recalled early childhood gender questionnaire. I then discuss the speaker demographics and the language attitudes and speech perception experiment. In Chapter 4, I describe my methodology for analysis and present the results of my study. I then conclude this thesis in Chapter 5 and discuss future direction for research using the data I have collected, as well as future research in the field of language and sexuality.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Over the past three decades, there has been an increase in studies on language and sexual identity. Kulick (2000) outlined how this research has mostly been separate from those studies on language and gender, which have ignored the relationship between language and sexuality all together. Early studies of language in relationship to sexuality (see Kulick 2000) focused on "lavender lexicons" and "camp." These studies and some studies that have followed (Hayes 1981a,b; Leap 1996; Gaudio 1994; Moonwomon-Baird 1997; Linville 1998) have assumed a common speech community among LGBT communities and have even coined the term "gayspeak" (Hayes 1981a). Overall, these early studies have investigated how someone who identifies as LGBT uses language as opposed to why someone might sound the way that they do.

Since the mid-1990s, other studies have attempted to explain why some men[1] might sound gay (Gaudio 1994; Moonwomon-Baird 1997; Crist 1997; Linville 1998; Podesva et al. 2001; Pierrehumbert et al. 2004; Levon 2006; Munson et al. 2006; Campbell-Kibler 2007; Levon 2007; Munson 2007; Podesva 2007; Piccolo 2008; Zimman 2010, 2013). These previous studies have proposed that one might sound the way they do because of both "social factors" and "acoustic factors." As Piccolo (2008) points out, these studies have also taken two approaches to understanding why some men might sound gay. The first approach she describes are studies that look at speech as reflecting identity. "The basis of this [first] approach is the hypothetical existence of a set of phonetic features that characterize gay/lesbian speech" (Piccolo 2008:13). The second approach, which studies speech as performativity, "focuses on the possibility that individuals can sound gay/lesbian or straight regardless of their sexuality" (Piccolo 2008:21). Piccolo (2008) along with other studies (Cameron 1997; Kulick 2000) have challenged the "language reflects identity" approach,

[1]There has also been studies on lesbian speech, but for the purposes of this thesis, I will mainly be focusing on literature that has investigated the speech of men.

which "assumes the existence of a [single] gay/lesbian tightly-knit speech community" (Piccolo 2008).

Just because someone is gay does not mean they will necessarily sound gay in every situation, nor does sounding gay make someone necessarily gay (Kulick 2000). Kulick (2000) goes as far as to simply state that "the fact that gays do X does not make X gay." These realizations have led the literature to ask the question as to why do some (gay/straight) men sound gay. This naturally leads to the question as to why in fact do some (gay/straight) men sound straight. There have been many studies which have focused on the acoustic differences between the speech of males and females (Schwartz 1968; Ingemann 1968; Schwartz & Rine 1968; Coleman 1971, 1976; Eldesky 1979; Bennett & Montero-Diaz 1982; Günzburger 1984), as well as male and female children (Weinberg & Bennett 1971; Sachs et al. 1973; Sachs 1975). While these studies have found that some men and women may deviate from the norm, none of these studies offer an explanation for why this may be.

This thesis focuses on the perceived speech of self-identified gay and straight men, thus aligning itself with the "performativity" approach to studying sexuality and its relation to language. This thesis complements work on studying speech that is perceived to be gay- or straight-sounding instead of only studying the speech of those who self-identify as gay or straight in order to really understand what "gay" or "straight" actually sounds like; it is still important to consider actual sexual orientation when doing a study like this, as it is unclear what role this variable plays in the perception of speech.

2.2 Acoustic explanations for gay speech

The past two decades have produced a variety of sociophonetic studies on some acoustic parameters hypothesized to be characteristic of gay speech, including: mean pitch (Gaudio 1994; Linville 1998; Jacobs et al. 2000; Munson et al. 2006; Munson 2007; Zimman 2010); pitch range or variability (Gaudio 1994; Jacobs et al. 2000; Levon 2006, 2007; Zimman 2010)' voice quality: falsetto and creaky voice (Podesva 2007)' vowel duration (Jacobs et al. 2000; Pierrehumbert et al. 2004; Munson et al. 2006; Piccolo 2008); vowel dispersion (Jacobs et al. 2000; Pierrehumbert et al. 2004; Munson et al. 2006; Piccolo 2008); vowel quality of Formant 1 (F1) and Formant 2 (F2) (Jacobs et al. 2000; Pierrehumbert et al. 2004; Munson et al. 2006; Munson 2007; Zimman 2010); stop voice onset time (VOT) (Jacobs et al. 2000); stop release (Podesva et al. 2001; Piccolo 2008); light and dark /l/ (Jacobs et al. 2000); sibilant duration (Linville 1998; Jacobs et al. 2000; Levon 2006, 2007; Zimman 2010); sibilant peak frequency (Linville 1998; Jacobs et al. 2000; Zimman 2010); sibilant

center of gravity (Munson et al. 2006; Zimman 2010); and sibilant skew (Munson et al. 2006; Munson 2007; Zimman 2010, 2013) .

Though there exists this vast literature on the acoustics of gay speech, these studies continue to contradict one another. Of all the acoustic variables that have been studied, sibilant skew is the only one that has been investigated more than once and not resulted in contradictory results. Because sibilant skew is the most robust of these acoustic cues as the best indicator to listeners of whether or not someone sounds gay or straight, my thesis focuses on sibilants, thought it is important to remember that the results on other acoustics parameters of sibilants (e.g., highest peak frequency, highest amplitude, duration, etc.) have been inconclusive. I focus my literature review on those studies that studied sibilants, including duration, peak frequency, center of gravity, highest amplitude, and skew.

2.2.1 Overview of studies on sibilants

Linville (1998) studied the speech patterns of five openly gay men and four straight men based on actual sexual orientation as well as perceived orientation from the judgments of 25 listeners. Linville (1998) reported that all speakers spoke Standard American English with no evidence of a regional dialect and ranged from age 24 to 43 years old. She reported that speakers had "lived" in California, Arizona, Florida, Georgia, Pennsylvania, and along the east coast before living in Wisconsin, where the study took place. Of all the gay speakers, only one had attended graduate school, while the rest were unemployed or working at minimum-wage jobs. The straight men were all employed and held upper middle-class jobs (e.g., engineer, sales, talent agent). Each of Linville's (1998) speakers were recorded reading a monologue by a gay character from a play. The listeners were 25 young adult females that ranged form 19-30 years old. All of the listener participants were students at Marquette University. She found that a longer duration and higher peak frequency of [s] and /ʃ/ significantly correlated with a participant being perceived as sounding gay as well as self-identifying as gay.

Jacobs et al. (2000) studied the speech of 24 speakers, eight self-identified as being straight and 17 as being gay. The speakers who ranged from 25 to 50 years of age had native fluency in a variety of Canadian English. The participants were asked to read two reading styles, a textbook paragraph about how a rainbow is formed and the same dramatic paragraph about a Fire (i.e., *Fire Passage*), from Crist (1997). Speaker participants were also asked to respond to an open-ended question, which was used to elicit spontaneous speech. Forty-six listener-subjects were recruited to listen to 75 thirty-second speech samples from the 25 speakers. There were two groups of listeners, 14 gay males, and

then a group of 32 whose sexual-orientation was unknown. The Jacobs et al. (2000) study corroborated Linville (1998): a longer duration and higher peak frequency of [s] significantly correlated with a participant being perceived as sounding gay.

Levon (2006) utilized the speech of just one white male speaker in his mid-20s from New York as stimuli for his study of sibilant duration. The participant was recorded reading a single neutral narrative. A pretest of 10 men and women listened to the narrative and judged the speaker as "extremely gay." The speaker's voice was digitally altered to shorten the duration of the sibilants and four stimuli were played for 121 listeners from Manhattan. As opposed to the earlier studies, Levon's (2006) study did not find any significant correlation between sibilant duration and whether or not the voice was being judged as sounding straight or gay.

Levon (2007) builds upon Levon (2006) in that the original four stimuli from the latter study were utilized along with four digitally altered stimuli from a man in his mid-30s, who was judged as "straight sounding" by the same group of 10 men and women as the in Levon (2006). These eight stimuli were then presented to a group of 123 undergraduate students in New York City. Again, Levon (2007:546) finds that "sibilant duration [...] does not appear to affect listener judgments of sexuality at all." Levon's results are inconsistent with other research; this is probably due to his use of manipulated speech rather than using natural human speech.

Munson et al. (2006) utilized two of three experiments to explore the production and perception of speech of gay, lesbian, bisexual, and heterosexual people. The first experiment consisted of 44 talkers, divided into groups of 11 (i.e., lesbian/bisexual women, straight women, gay/bisexual men, and straight men) who were recorded reading a 32 token word list. The talkers ranged from 18 to 40 years of age and had reported living in the North Central dialect area of the United States (Munson et al. 2006). From this first experiment Munson et al. (2006) found that [s] skewness interacted significantly with actual sexual orientation. The [s] of the gay and bisexual men was significantly more negatively skewed than that of heterosexual men, that is, the energy of [s] was concentrated above the median frequency rather than below it. This was correlated with actual sexual orientation. When it came to perceived speech, in experiment two, Munson et al. (2006) had 40 listeners from the University of Minnesota community that ranged from 18-40 years of age listen to 12 words from the 44 speakers and rate the speakers from "definitely sounds heterosexual" to "definitely sounds gay, lesbian, or bisexual." The study found no significant correlation between skewness of [s] and the perception of speech.

Zimman (2010) investigated the perceived mean duration, mean frequency at peak amplitude, and mean center of gravity of eight participants: three which he described as identifying as trans men[2], two as gay-sounding nontrans men, and three straight-sounding nontrans men. His participants were recruited from the University of Colorado at Boulder and in San Francisco, CA. They ranged in age from 20-27, except for one gay male who was 47 years old. The speakers read the *Rainbow Passage* and the *Fire Passage* used in Jacobs et al. (2000) but Zimman (2010) only used data gathered from Crist's (1997) *Fire Passage*. Eight listener subjects, who are native speakers of English, were presented with 30 second clips from the *Fire Passage* and were instructed to judge each speaker as sounding gay or straight (among other traits) along a five-point scale. "Listener evaluations correlated strongly with [his] preliminary groupings of men as gay- or straight-sounding" (Zimman 2010:9). His results show that for [s], the trans men group had a significantly higher center of gravity than the other two groups. His statistics also suggest that despite the trans men group and the gay-sounding nontrans men group both being perceived as gay, the acoustic results do not reflect this relationship. Though the straight-sounding nontrans men were perceived as sounding significantly different that the trans men group, there was no significant difference in the center of gravity of [s] between the gay-sounding nontrans men and the straight-sounding nontrans men.

In Zimman (2013), 15 men from Colorado and California were interviewed, five of which indentified as trans men, five as gay cis[3] men, and five as straight cis men. They were of mixed ethnic background (e.g., Asian, Latino, Filipino, Iranian, white) aged 19 to 51. He had the 15 participants read the *Rainbow Passage* from Jacobs et al. (2000) and then used identical excerpts of approximately 30-seconds from the middle of the text to use in collecting listener ratings as well as acoustical analysis of [s]. Forty-three native speakers of English completed the listening task. All listeners were recruited from the University of Colorado student body. Zimman (2013) found that those participants that were perceived as sounding gay (despite their self-identified sexuality and gender) had significantly more negative skew than the group perceived as straight-sounding. He found that the trans men fell somewhere between the gay group and the straight group in terms of skewness but that there was no significant difference between the skewness of [s] of the trans men as compared

[2]Female-to-male transsexuals

[3]*Cis-* is the Latinate prefix that serves as the opposite of trans- (e.g., in the grammatical terminology that distinguishes translocatives [over there] from cislocatives [over here]). Cis- means on the same side as, and many transgender people have picked up on this term by creating the words cisgender or cissexual to refer to those who identify with their assigned gender and sex (Zimman 2012:7).

to the straight men. The trans men, however, were all judged as sounding gay. Zimman (2013) found no significant correlation of center of gravity and gayness judgments, which contradicts Zimman (2010).

The studies described above have focused on the acoustic explanations of why some men sound gay and some sound straight are robust and include the study of many different acoustic variables, as well as differing methodology for collecting data. Gay-sounding speech cannot be reduced to just one or two acoustic markers. Not only can the study of gay-sounding speech not be reduced to a couple of acoustic variables, but multiple social variables should be considered as well.

2.3 Social explanations for gay speech

Gaudio (1994) and Linville (1998) hypothesized that "gay voices" were the result of men who identfied as gay belonging to one gay community and thus unconciously acquiring a similar style of speech. If this is the case, where did this style come from? Gaudio (1994) notes that gay men, like straight women have a wide range of pitch variability, so gay men must style their speech after straight women, though he is quick to point out that straight feminiity is not homologous with gay masculinity. As Jacobs et al. (2000) stated, this sexual identity hypothesis for describing gay speech assumes that only those who have come out and have aligned themselves with a gay community sound gay. What about those straight men or men who have not yet come out of the closet who sound gay? Jacobs et al. (2000:57) believe "that phonological habits are acquired at a much younger age."

Zwicky (1997:29) hypothesized that "pyschosocial mechanisms in acquisition of a gender identity and its associated norms of behavior" may play a role in why some men sound gay. Zwicky (1997) and Jacobs et al. (2000) question why a gay man or even a straight man would adopt a socially stigmatized speech variant. Zimman (2010:15) cites Flipsen et al. (1999) as finding that "phonetic gender differences [...] are known to arise early in life." Zimman (2010:15) suggest that "[gender] socialization during childhood [may] deserve more attention" (see also Sachs et al. 1973; Sachs 1975).

Munson (2007) rejects the idea of gender socialization playing a role in how gay and straight men's voices develop. Munson (2007) found that when testing for perceived sexual orientation and a feminine or masculine gender identity, the results were not the same. Munson (2007) believed that gay-sounding voices would be judged as sounding feminine and straight-sounding voices would be judged as sounding masculine. Participants in the study, which was designed similar to Munson et al. (2006), judged differently between feminine- and gay-sounding men's voices. Munson (2007) also found that fundamental frequency

correlated more with a voice being judged as sounding either feminine or masculine while [s] skew correlated more with a voice being judged as sounding gay or straight.

Given what Eckert (2011) found in preadolescent youth in Northern California, the idea that young men may acquire different speech patterns based on their childhood gender socialization seems more likely, especially more so than the hypothesis that gay men acquire a gay-sounding voice because of their membership in a gay community. Despite Jacobs et al. (2000) and Zimman's (2010) (as well as Piccolo 2008) suggestion that childhood gender socialization may be playing a role in the development of gay- and straight-sounding speech, none of these studies consider the issue directly, which is lacking in the overall literature on language and sexuality.

One study that has considered childhood gender socialization is Renn (2002), though he deviates from earlier studies and does not consider any acoustic properties. Renn (2002) recorded 58 men, 30 gay, four bisexual, and 24 straight, reading an excerpt from *Torch Song Trilogy* from Gaudio (1994) and Linville (1998). The participants also completed a childhood behavior scale. Four listeners rated the 58 voices on a 7-point scale for how gay each sounded. Based on the results of Renn (2002), gay-sounding speech may be linked to childhood gender nonconfrmity rather than one's sexual orientation, which aligns itself with the hypotheses of Jacobs et al. (2000) and Zimman (2010).

2.4 The experimental design of previous studies

The earlier studies outlined above have varied in their controls for age and regional origin. Other factors that may influence the perception of one's speech are ethnicity, socioeconomic status, and life stages (Eckert 1989), all of which may influence production and perception of speech. Many of the studies reviewed above ignored or did not report the ethnicity, socioeconomic status, or the life stages of their participants, except for Linville (1998) and Zimman (2013). The methodological differences may be a factor as to why the results of these studies are contradictory. Sounding gay or straight is not an inherent property; cultural differences between speakers and listeners cannot be ignored.

Studying speech based only on self-identified sexual orientation (Gaudio 1994; Linville 1998) is problematic as later studies (Zwicky 1997; Jacobs et al. 2000; Levon 2006; Munson et al. 2006; Levon 2007; Zimman 2010, 2013) have shown that not all gay men sound gay and not all straight men sound straight. In fact, Linville (1998) found that her listeners were only able to correctly identify the sexual orientation of her speakers 79.6% of the time. When using a statistical model like the mixed effect model, sexual orientation should still be considered because it is a variable that may still have some effect on the perception of

the speech. It is important to note that we can test whether people sound gay or not, but not whether someone actually is gay.

Levon (2006, 2007) implies that even using gay men to obtain "gay" speech and straight men to obtain "straight" speech should be avoided as it is implies homogeny among the groups and "runs dangerously close to assuming a necessary and fixed relationship between the construct of gay and straight and the language style associated with these social positionings" (Levon 2006:60). However, his method of utilizing the digitally altered voice of one native English speaker from New York seems to be problematic as it may not sound natural enough and this may influence the perception of the speech.

While most studies have used a reading style of speech, very little has been done on spontaneous speech and how it may affect perceptions of a voice. The Jacobs et al. (2000) study's use of spontaneous speech was definitely a move in the right direction, but it is not clear whether or not an open-ended response to one question is enough to elicit the type of speech that is close to natural as possible for a speaker. Their findings suggest that the dramatic reading of the *Fire Passage* (Crist 1997) was similar to the spontaneous speech at a significant level; this may be due to the speakers not having had enough time to begin to feel comfortable and relaxed by the time they were asked the question that elicited spontaneous speech. The use of other readings, such as the monologue of a gay character from a play (Linville 1998; Renn 2002) and the *Rainbow Passage* (Jacobs et al. 2000; Zimman 2010, 2013) are also problematic as they may contain metalinguistic cues that might lead listeners to believe that a voice is gay, based on content, and not on actual production. Zimman (2010) decided to exclude the data collected from the *Rainbow Passage* because the significance that a rainbow has in the LGBT community may have influenced the speakers perceptions.

It is not yet clear, given the studies reviewed above, what role, if any, age plays on the perceptual side of this research. The studies have speakers that range from late teens to early 50s. The age of the speaker is sure to influence results, as Zimman (2013) found when he studied creak. His older participants (in their 40s and 50s) were found to use creaky voice far less frequently than the younger participants. Perceptually, listeners of different ages may yield different results. Older listeners may be more conservative in their judgments and less willing to judge someone as sounding gay, though this may not be the case. It may be the case that we need to take into consideration the amount of exposure someone has to both heterosexual and LGBT communities, as this may influence results.

Another factor that may be problematic is dialect. Some of the studies, Linville (1998);

Jacobs et al. (2000); Renn (2002), did not elaborate on which exact dialects their speakers actually used. The trend of saying "native Speakers of American/Canadian English" seems to brush aside an important variable when it comes to studying the speech of gay and straight men. Munson et al. (2006) states that their speakers are from the North Central dialect region of the United States, but it is not clear whether the speakers are from rural or urban areas. Zimman's (2012) speakers were recorded in two completely different dialect regions: San Francisco, CA and University of Colorado at Boulder, CO. The University of Colorado and San Francisco attract people from all over the world. It is important to remember that the locality of a study does not necessarily represent speakers' origins. An even bigger factor in relation to dialect would be the dialect of the listeners as compared to that of the speakers. Dialect features may be different for speakers and listeners. For example, a listener from one dialect who is listening to [s] that is normatively more negatively skewed in another dialect may perceive all the speakers as sounding gay, based on dialectal differences.

Not only should dialect be controlled, but ethnicity, socioeconomic status, and perhaps even life stage (e.g., all participants are young professionals, all are undergraduate or graduate students, etc.). Having speakers from multiple ethnicities (Piccolo 2008; Zimman 2013) may be problematic as listeners might attribute differences in voice to ethnic differences in the voice and not perceived sexual orientation. Level of education, which influences socioeconomic status, also plays a role in how a voice is perceived (Campbell-Kibler 2007). The fact the Linville's (1998) straight participants had all completed college and were all employed with upper-middle class paying jobs and the gay participants were all working minimum-wage jobs or were unemployed might have produced results that were not testing speech based on perceived sexual orientation, but speech based on level of education and socioeconomic status (for more on the importance of such controls, see Di Paolo & Yaeger-Dror 2011).

The literature, as it stands, does not include a study that combines an acoustic explanation along with the gender socialization explanation of why some men grow up sounding gay and some sounding straight. This study attempts to rectify this, by using a carefully controlled methodology to discover the relationships between gender socialization, speech production, and speech perception.

2.5 Research questions

This study attempts to answer the following questions:

- Q1 Why do some men sound gay and some sound straight?
- Q2 What role does gender socialization in childhood play in whether or not someone is perceived as sounding gay or straight?
- Q3 Does style play a role in whether or not someone is perceived as sounding gay or straight?
- Q4 What role does the acoustic features of [s] play in whether or not someone is perceived as sounding gay or as straight?

2.6 Hypotheses

2.6.1 Gender socialization

As has been discussed in this chapter, there have been two major explanations as to why some men sound gay and some men sound straight: acoustic explanations and social explanations. My hypothesis is that early childhood gender socialization during the critical language period (Penfield & Roberts 1959) may be one factor that influences how we speak into adulthood, which was found by Renn (2002).

Eckert (2011) suggests that by adolescence, "individuals' patterns of linguistic variation are, by this time, better predicted by their own forms of engagement in the peer-based social order than by their family's class or ethnic origins." In her discussion of the heterosexual market (Eckert 2011) she notes the gender opposition begins with boys forming football teams and appointing popular girls to be the "team owners." Where do the outliers (i.e., the boys who do not like to play football, or the unpopular girls) fit in this heterosexual social hierarchy? Perhaps, some of these boys play with the unpopular girls or with other boys like them (i.e., those who do not like to play football at recess) and this gives some context to how gender and sexual linguistic identities are formed at an early age.

In short, this thesis hypothesizes that those young boys who conform to stereotypically normal societal gender roles and behavior (e.g., play football at recess, play trucks and cars, are a daddy's boy, etc.) are more likely to be perceived as having a straight-sounding voice in adulthood. On the other hand, those young boys who do not conform to stereotypically normal societal gender roles and behavior (e.g., play with dolls, dress in female clothes, jewelry, and makeup, are a momma's boy, etc.) are more likely to be perceived as having a gay-sounding voice in adulthood (Renn 2002).

2.6.2 Style

Register (Reid 1956) in linguistics describes the variety of language that is used for a particular purpose (e.g., reading vs. nonformal speech setting). In sociolinguistic research in the United States, register is often referred to as style (Labov 1966). My study includes three such styles: a dramatic reading, a scientific reading, and casual interview speech, which I refer to as "spontaneous speech." Because of attention paid to speech (Labov 1972) in some styles and hyperarticulation in relation to perceived sexualities (Podesva et al. 2001), I hypothesize that the speech in these three styles influences the judgments of each of the voices perceived as sounding more gay or more straight. While there may be a spectrum of voices along a continuum from gay- to straight-sounding speech, the results will skew more towards gay-sounding speech or more towards straight-sounding spoeech, depending on the style and thus each voice may not always receive the same Likert scale score. Style may be a predictor of perceived gay- or straight-sounding speech. Another possibility is that the more formal the speech style, the less likely that the speech will be judged as sounding gay, since listeners will be attributing hyperarticulation and lengths of vowels and consonants to the more formal style rather than to sexual orientation.

Given the results from previous studies (e.g., Jacobs et al. 2000), I hypothesize that judgments on the dramatic reading will yield results that lean more towards gay-sounding speech than straight-sounding speech. Judgments on the scientific reading will yield the opposite of the results from the dramatic reading and will lean more towards everyone having scores that indicate straight-sounding speech rather than gay-sounding speech. Another possibility is that the judgment for the natural speech will neither skew towards gay-sounding or straight-sounding.

2.6.3 Acoustics of [s]

Given the results of previous research (Linville 1998; Jacobs et al. 2000; Levon 2006; Munson et al. 2006; Levon 2007; Zimman 2010, 2013) on gay and straight speech as well as on gendered speech, as is presented in this chapter, I hypothesize that those speakers who produce [s] with a higher peak frequency, higher amplitude, and higher spectral center of gravity will be judged as sounding gay and those with a lower peak frequency, lower amplitude, and lower spectral center of gravity will be judged as sounding straight. Those speakers whose [s] is more negatively skewed will be judged as having gay-sounding speech and those with less negatively skewed [s] will be judged as having straight-sounding speech.

CHAPTER 3

METHODOLOGY

3.1 Speakers

3.1.1 Recruitment

The speakers for the first study were recruited using a snowball effect model of recruitment, utilizing online social media (e.g., Facebook, Twitter, Reddit, etc.) in the Salt Lake City region and my personal contacts in Salt Lake City. Possible participants were informed that in order to participate they needed to fit the following description: they had to have grown up within 20 miles of the Salt Lake Valley, in Utah (see Figure 3.1); be between the ages of 18 and 30; been raised in the Church of Jesus Christ of Latter-day Saints; served a 24 month mission for the church; and identify as either straight or gay. These strict criteria were used to control for geographical origin (i.e., regional dialect), age, gender socialization throughout similar life stages up until the participants completed their mission, and to attempt to have a mix of both gay and straight voices. The participants were told they would be participating in a study on LDS gender socialization and would be be interviewed for approximately one hour. There was no mention about speech in the recruitment process in order to lessen the effects of attention paid to speech during the interviews (Labov 1972; Eckert & Rickford 2002).

3.1.2 Demographics

Fourteen participants (see Table 3.1) were recruited for the first study. Seven self-identified as gay and seven self-identified as straight cismale. This means that the speakers that took part in the first study all identified as being born a male and identified as male, at the time the interview took place. This self-identification classification was verified during the interview using a Kinsey Scale (Kinsey et al. 1948), which can be seen in Appendix E. The 14 participants were all between the ages of 22 and 29 and grew up within a 20 mile radius of the Salt Lake Valley, in an urban or suburban location.

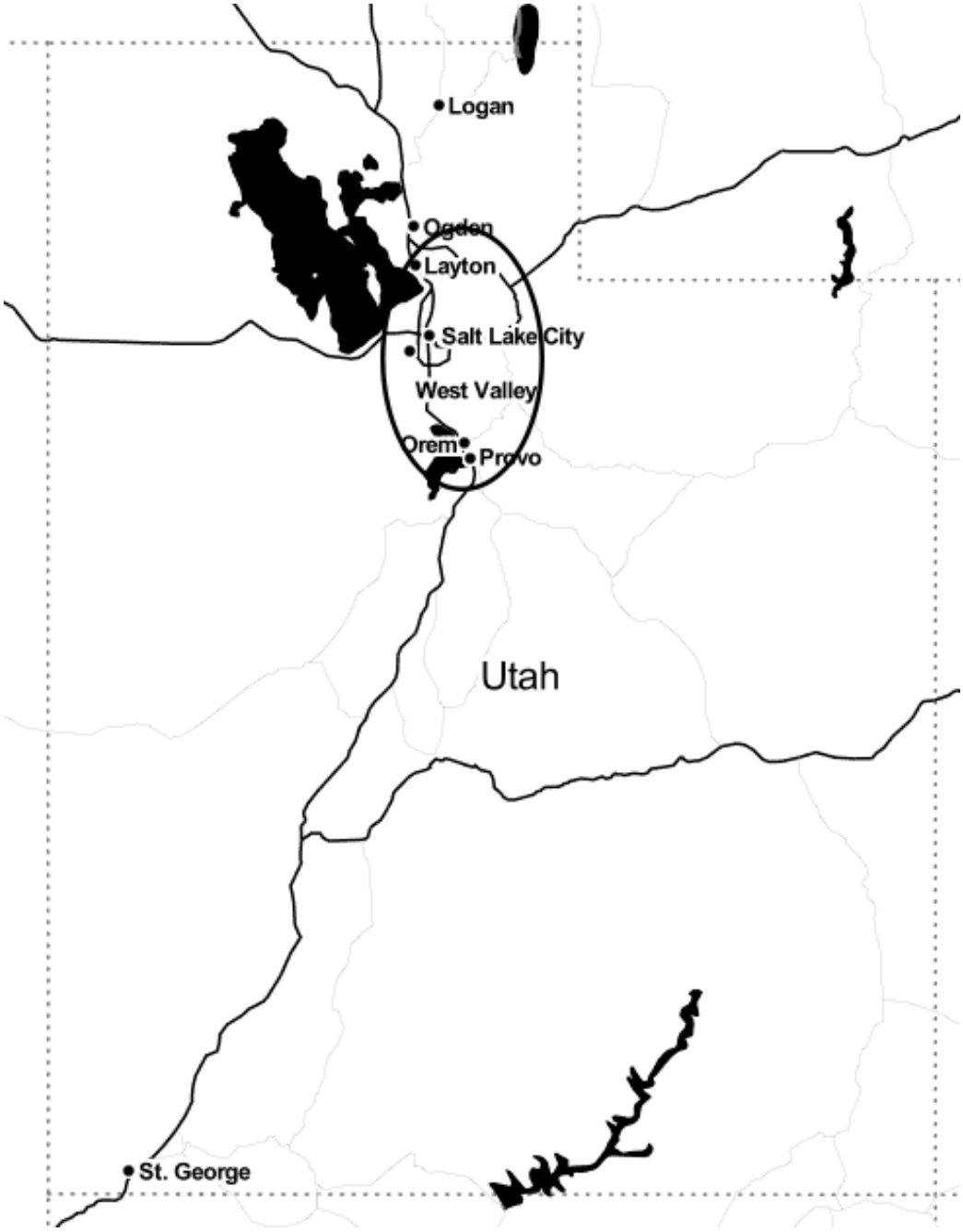

Figure 3.1: This map shows the area in Utah (within the black circle) from which the speakers in the first study were recruited.

Table 3.1: Speaker demographics

Speaker	Age	Heritage	Location Growing Up	Education Level	Kinsey Scale
GM1	24	English & Swedish	Orem	Bachelor's	5
GM2	29	German & English	Clearfield	MBA	4.5
GM3	29	Welsh	American Fork	Bachelor's	4
GM4	29	Scottish & English	Salt Lake City	Master's	5
GM5	26	Mexican & English	Tooele	Bachelor's	4
GM6	26	Danish & Scottish	Lehi	Bachelor's	6
GM7	24	Scottish, German, & Swedish	Salt Lake City	Bachelor's	5
SM1	28	White European	Salt Lake City	Associate's	0
SM2	27	Swiss, German, English, & Dutch	Holladay	Bachelor's	1
SM3	29	White European	Along Wasatch	Bachelor's	0
SM4	22	German, English, Danish, & Norwegian	Salt Lake City	Bachelor's	0
SM5	27	German	West Valley City	Bachelor's	1
SM6	23	Norwegian, Scottish, & English	East Millcreek	Bachelor's	0
SM7	25	English, Scottish, Dutch, & Welsh	Sandy	Bachelor's	0

All 14 speakers were raised as active members of the church for at least the first 21 years of their life and served at least two-thirds of a 24 month mission.

"When Latter-day Saints speak of being 'active in the Church,' they have reference to observing a full religious lifestyle of attendance, devotion, service, and learning" (Ludlow & Brigham Young University 1992:14). At the time of the interviews, half of the speakers had disengaged from the church; only half remained active, five of which identified as gay and two as straight. Those members who "disengage" from the church "are usually referred to as inactive or less-active members (Ludlow & Brigham Young University 1992:14). These

"disengaged members" are usually still affiliated with the church and identify with the church in some way (Ludlow & Brigham Young University 1992). I did not ask the speakers about their official membership (i.e., on paper) with the church, only if they were still active or not.

All 14 participants reported that they were native speakers of Utah English and reported being of white European ancestry, except for participant GM5 who reported having one-fourth Mexican and three-fourths white European ancestry. Given the responses to a question about their parents' careers, all participants were raised in middle-income households. Thirteen of the 14 participants attended public primary and secondary schools. Speaker GM6 was home schooled along with his 8 siblings.

Thirteen participants were currently or had attended a four-year university or college and one participant was studying at a community college with plans to transfer to a four-year university. Those who were not full-time students at the time of the interview were currently employed, except one speaker who was unemployed at the time.

3.1.3 Historical, cultural, and linguistic situation of speakers

In this section, I will present the historical, cultural, and linguistic situations of the 14 speakers from the first study. I will first describe the sociocultural importance of The Church of Jesus Christ of Latter-day Saints in the targeted geographical area as well as the importance of the LDS population in a study on language and gender socialization. I will then discuss the emergence of an ever present gay community within the United States, Utah, and even within The Church of Jesus Christ of Latter-day Saints, which has made it possible to do this study.

On July 24, 1847, the Salt Lake Valley (as seen in Figure 3.2) was settled by Brigham Young leading the first LDS settlers. Brigham Young at the time was the President of the The Church of Jesus Christ of Latter-day Saints (The Church of Jesus Christ of Latter-Day Saints 2004). Linguistically the area of northern Utah is relatively homogenous, which is due to the migration patterns of early English ancestry to the region during the late 19th century (Di Paolo 1993; Sykes 2010) and the large Mormon dominance in the culture. English ancestry is important but most early Mormons came from the South Midland area of the United States. Recent research (Sykes 2010; Alzoubi et al. 2013) in Utah, and more precisely the areas and counties immediately surrounding Salt Lake City have shown that the Utah dialect may be more distinct than previously thought (Labov et al. 2006).

Figure 3.2: This map shows the location of the Salt Lake Valley and where speakers in the first study reported to have primarily grown up.

Just over 67% of Utah's current population is concentrated in the north-central part of the state in Davis, Salt Lake, and Utah counties, with Salt Lake County – which encompasses the Salt Lake Valley and includes the Metropolitan Statistical Area of Salt Lake City – having the largest population of just over one million people (United States Census Bureau 2010). The church reports having just over 15,000,000 members worldwide with 6,312,416 residing within the United States (The Church of Jesus Christ of Latter-Day Saints 2014). Out of the 2,763,885 people living in Utah (United States Census Bureau 2010), 71% or 1,951,937 are members of the church (The Church of Jesus Christ of Latter-Day Saints 2014), with the majority of them living in the three previously mentioned counties. It is commonly reported that less than 50% of Salt Lake City is LDS, but no official reports could be found to support this report. Participants for the first study grew up in or within 20 miles of the boundaries of the Salt Lake Valley.

The Church of Jesus Christ of Latter-Day Saints plays a large role in many of the lives of Utahns, whether they identify as LDS or not. The church influences local and national politics as well as the social interactions of almost every Utahn who has grown up in Utah. The social geographer Meinig (1965) described the culture of Mormonism as forming a "cultural area" throughout the Intermountain West. "Mormon identity can be considered an ethnic identity. Full membership within the Mormon community in Utah requires a great deal of commitment" (Sykes 2010:15).

From an early age, boys who are raised in The Church of Jesus Christ of Latter-day Saints follow a very similar path to prepare them for a Mission at 19 years of age[1]. Young LDS boys and girls attend primary together from 18-months to when they turn 12. Primary is where young LDS boys and girls learn about the Gospel of Jesus Christ (Ludlow & Brigham Young University 1992). Most young boys in Utah, LDS and non-LDS alike, take part in Boy Scouts of America (BSA) when they reach school age. The church is the largest supporter of the BSA in Utah (Boy Scouts of America 2014).

According to Ludlow and Brigham Young University (1992), at 12, LDS boys enter into the Aaronic Priesthood, one of two priesthoods. They become a teacher at 14 and a priest at 16 years of age. At 18 most LDS men enter into the Melchizedek Priesthood and hold the title of Elder. Before an Elder is able to be called to a mission, he must have gone through the Temple, which requires a church sanctioned Temple Recommend. In order to be issued a Temple Recommend, an LDS man or woman meets with their Bishop in a

[1]In October 2012, The Church of Jesus Christ of Latter-day Saints changed the minimum age for men to serve on their mission from 19 to 18. All participants in my study started their mission at 19.

private meeting where the Bishop discerns the worthiness of the individual to "receive the covenants, ordinances, and blessings of the temple" (Ludlow & Brigham Young University 1992:1446).

Once an Elder has received "the covenants, ordinances, and blessings of the temple" (Ludlow & Brigham Young University 1992:1446), he may receive his calling to a mission. The mission consists of receiving a calling to go on a mission (the church chooses the location); training at the Missionary Training Center; and then serving the mission with a series of other missionaries, called companions. Once their mission is complete, an LDS man is usually referred to as an RM (returned missionary). Some may choose to follow other callings within the church and may take on different roles throughout their lifetime. For the purpose of this study, it is important to understand this linear timeline of socialization for all of the speakers up until they became RMs because it is nearly identical for each participant and provides quasicontrol over how the participants in this study were socialized.

It is safe to say that given the 14 speakers' ancestral background, their socialization within the church, and the geographical location where they grew up, the chance that regional dialect variation among the participants will influence the results of this study is very low.

3.2 Interviews, reading tasks, and psychometric survey

One-shot, semistructured sociolinguistics-style interviews (Labov 1972) were conducted one-on-one with the 14 speakers in a small office on the University of Utah campus. Both the speaker and interviewer wore audio-technica AT8531 unidirectional lapel microphones. The interviews were recorded at a sample size of 16 bit with a sample rate at 44.1kHz, an appropriate range for analysis of sibilants, which tend to have a frequency of 4,000 Hz to 10,000 Hz (Zimman 2010). The interviews were recorded from the moment the speaker gave written consent to participate in the study until the completion of the interview. All tasks were recorded. The recordings ranged from 30 minutes to 90 minutes long.

3.2.1 Geographical and biographical interview

After each participant finished giving his written consent to participate in the study, I read the directions (Appendix A) for the demographic portion of the survey. The demographic questions (Appendix A) served as a way to understand more about each of the participants by asking them questions about where they grew up, which helped define their dialect area; their age; their relationships with family; their educational background; their

participation inside and outside of school; their participation in their local community; and their participation within The Church of Jesus Christ of Latter-day Saints, including a detailed description from when they found out they had been called to serve a mission, to their experience at the Missionary Training Center, their experience during the mission, and finally, returning from their mission. At no time during this first portion of the interview was anything about language and speech mentioned, except the question that asked them about their native language and knowledge of other languages (i.e., when they talked about serving abroad). All of them grew up speaking English in their home.

3.2.2 Reading tasks

In order to elicit multiple tokens of [s] and to test the effects of style on how a voice is perceived, two reading passages were chosen for the speakers to read. The first was a scientific article about the platypus (Appendix B) from National Geographic (National Geographic 2012). The second passage (Appendix C), which is called the *Fire Passage* (Crist 1997), is a passage in first person about a fire that started down the road from the narrator at night. This passage was used to elicit a more dramatic style of speech than the scientific article. Jacobs et al. (2000) suggest that this passage elicits a style that is close to everyday spontaneous speech.

After the first portion of the interview was completed, I handed the speaker the Platypus Passage. The speaker was asked to read the passage out loud like they were reading the article to a group of young children and were teaching them about the animal. They were told that there would be some questions about the article when they were finished. The speakers were told to take time to look over the passage before reading it out loud (Appendix B). Most of the speakers had to read the passage only once. Two participants had to reread some portions of the passage as they found some sections funny and would begin to laugh. In order to maintain the illusion that this study was more about socialization and had nothing to do with speech, each speaker was asked a few questions about the article in terms of gender socialization (Appendix B).

For the *Fire Passage*, the speaker was told to read it as if they were the character in the story and were talking about their family or friends (Appendix C). They were also given time to look at the passage before reading it out loud. Again, some of them were able to successfully read it without much hesitation the first time, but some had to repeat some portions because they would stumble over words or would start laughing. They were then asked if they thought the narrator in the story was male or female (Appendix C).

3.2.3 Psychometric survey

The speakers were then handed the 23 question Recalled Childhood Gender Identity/Gender Role Questionnaire (Appendix D) (Zucker et al. 2006). They were told that the questions would ask them about their behavior as a child, meaning from "0 to 12" years old and to circle the response that best described their behavior (Appendix D). The speakers were left as much time as they needed to complete the questionnaire, which took on average five to seven minutes to complete. After they were done, they were asked follow up questions (Appendix D).

The questionnaire, which includes 23 multiple choice Likert scale questions – 22 of which include a five-point Likert scale and one which includes a four-point Likert scale (question 17) – attempts to "measure recalled gender-typed behavior and relative closeness to mother and father during childhood" (Zucker et al. 2006:469). Four of the questions (i.e., 16, 17, 22, and 23) measured the relative closeness to mother and father during childhood. The other 19 questions were a mix of questions about behavior and feelings of identity (Appendix D).

Lower responses (1-2) reflected more relative closeness to one's mother and more female typical responses or responses of nonconformity to societal gender norms. Higher responses (4-5) reflected a more relative closeness to one's father and more male typical responses or responses of conformity to societal gender norms. A median response (3) reflected relative closeness to both mother and father and response of both conformity and nonconformity to societal gender norms.

3.2.4 Relationship/sexuality interview and the Kinsey Scale

After the Recalled Childhood Gender Identity/Gender Role Questionnaire was administered, I informed the speakers that they would be asked a series of questions about their attractions and romantic relationships growing up. The full instructions for this portion of the interview can be found in Appendix A. Two preliminary questions (Appendix A) were asked to explore how each of the speakers identified in terms of gender and sexuality. At this point, a copy of the Kinsey Scale (Appendix E) was handed to them and they were told to circle the number that best described how they identified sexually.

Depending on how each participant responded to the sexuality question and the Kinsey Scale, they were asked a series of questions in relation to their self-identified sexuality: questions for straight-identified participants (Appendix A); questions for gay-identified participants (Appendix A); and questions for participants who experience/have experienced same-gender attraction (Appendix A). The last category of questions was included in case

one of the speakers who stated that they were straight during the recruitment process actually experienced same-gender attraction, a term used by the church, which differentiates feelings from actions (i.e., identifying as lesbian/gay).

The three categories of questions were almost identical, asking first attractions, dating, marriage, having children, relationship with parents in terms of talking about sex, etc. The questions for the gay-identified and those who experienced same-gender attraction differed only in that they gave more options when talking about attractions and dating, as well as included questions about coming out, being gay, or the experience of having same-gender attraction. None of the gay or straight identified speakers identified as having same-gender attraction, which as stated above is different from self-identifying as gay.

The last set of questions, which were not mentioned in the directions for the last part of the interview, asked speakers to think about their speech and the speech of others. They were asked questions that asked them if they thought they sounded gay/straight, if they chose to sound the way they do, and to give impressions of different types of voices (e.g., what does a stereotypical gay-sounding/straight-sounding man sound like?). At the completion of the second interview, the speakers were given a debriefing document (Appendix F), which informed them of the true purpose of this study and that portions of their speech during the interview would be used in a subsequent study. The speakers were given the option to pull form the study, but none of them did.

3.3 Listeners

Like the speakers in the first study, listeners in the second study were recruited using a snowball effect model of recruitment, utilizing online social media (e.g., Facebook, Twitter, Reddit, etc.) and my own personal contacts. Initially, during recruitment, there were no controls and anyone who understood English enough to be able to access an online survey was able to participate in the second study. An offer to be put into a drawing for one of four $20 Amazon gift cards was offered to compensate for the listeners' time.

3.3.1 Demographics

Forty-one participants were recruited for this study. Five participants were not considered, as they were not native speakers of American English. One participant was also not considered because the majority of their answers were incomplete. Of the 35 participants that were considered for this study, 19 were from a state other than Utah, or their location was unknown; 24 have lived in Utah (16 of which are from Utah); 14 were LDS; 19 identified as female and 16 identified as male; seven identified as LGBT and the rest identified as

straight; and seven responded "no" to the following question: are you close to someone or do you regularly interact with someone who identifies as a sexual or gender minority? (e.g., lesbian, gay, bisexual, transgender, queer, questioning, two-spirit, intersex, asexual, etc.). The only control for age was that one had to be 18 years old or older to participate; the listeners ranged from 19 to 65 years of age. Table 3.2 details the demographics that are described in this paragraph.

3.4 Matched-guise language attitudes and perception experiment

In order to obtain judgments of perceived gay- and straight-sounding speech, a matched-guise language attitudes and perception experiment was created, using data obtained from the recordings of the speakers in the first study. Since very little work has been done with a more spontaneous style of speech[2], this study follows the lead of Jacobs et al. (2000) and uses data not only from the the two read styles, but also from the spontaneous speech collected during the interview.

3.4.1 Audio data

I created 30-second audio clips of each speaker from all three styles. To do this, I utilized the transcripts of the two reading passages and compiled a list of words that contained all instances of phonetic [s][3]. I counted all instances of phonetic [s] in each reading passage and then determined the average reading time of each speaker by measuring the time stamps of the slowest reader and the fastest reader, only accounting for the time it took them to read the actual reading passages. This measurement was done in order to determine which sentences would fit in a 30-second audio clip, since the same sentences would have variable times depending on the rate of speech.

I chose which parts of the reading would be included in the 30-second audio clips. For the scientific style of speech (i.e., the Platypus Passage), four sections of the passage were chosen. For the dramatic style of speech (i.e., the *Fire Passage*), three sections of the passage were chosen. These sections were chosen based on how many tokens of [s] each one contained (to add up to 20) and how fast the sections were read together, on average (to add up to 30 seconds). The passages can be seen in Table 3.3.

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[2]Note that this means spontaneous speech within an interview setting.

[3]This was done purely from the orthographic representations. Later, when I listened to the passages, some of the tokens that are phonetically /z/ were pronounced as [s] as there is a great deal of devoicing going on in the dialect of Utah English.

Table 3.2: Listener demographics

Listener	Age	From	Lived in Utah	LDS?	Gender	Sexuality	Close to LGBT
1	28	N/A	No	No	Male	Straight	No
2	20	MA	No	No	Female	Straight	Yes
3	32	OH	No	No	Female	Straight	Yes
4	32	IA	No	No	Female	Straight	No
5	29	CO	No	Yes	Male	Straight	Yes
6	26	WI	No	No	Male	LGBT	Yes
7	23	CO	No	Yes	Male	Straight	No
8	37	CO	No	Yes	Male	Straight	Yes
9	34	CO	No	Yes	Female	Straight	Yes
10	56	OH	No	No	Female	Straight	Yes
11	33	NE	No	No	Female	Straight	Yes
12	23	NY	Yes	No	Female	Straight	Yes
13	24	UT	Yes	Yes	Male	LGBT	Yes
14	27	SC	Yes	No	Female	LGBT	Yes
15	32	CO	Yes	Yes	Female	Straight	Yes
16	37	CO	Yes	No	Male	LGBT	Yes
17	32	MD	Yes	No	Male	Straight	Yes
18	21	UT	Yes	No	Female	Straight	Yes
19	24	UT	Yes	Yes	Female	Straight	Yes
20	30	NV	Yes	Yes	Male	Straight	Yes
21	23	UT	Yes	No	Female	Straight	Yes
22	20	UT	Yes	No	Male	Straight	Yes
23	47	MN	Yes	No	Female	Straight	Yes
24	19	UT	Yes	No	Female	Straight	Yes
26	20	UT	Yes	No	Female	Straight	No
27	21	UT	Yes	No	Female	LGBT	Yes
28	24	PA	Yes	No	Female	Straight	Yes
29	32	UT	Yes	Yes	Male	Straight	Yes
30	40	UT	Yes	Yes	Female	LGBT	Yes
31	31	IL	Yes	No	Female	LGBT	Yes
32	23	UT	Yes	Yes	Male	Straight	No
33	20	UT	Yes	No	Male	Straight	Yes
34	36	UT	Yes	Yes	Female	Straight	No
35	65	UT	Yes	Yes	Female	Straight	No
36	24	UT	Yes	Yes	Male	Straight	Yes

Table 3.3: Excerpts from reading passages

Passage	Text
Scientific 1	The **platypu*s*** is among **nature'*s* mo*s*t** unlikely **animal*s***. In fact, the first **scienti*s*ts** to examine a ***s*pecimen** believed they were the victims of a **hoa*x***.
Scientific 2	**Platypuse*s*** hunt underwater, where they ***s*wim gra*c*efully** by paddling with their front webbed feet and ***s*teering** with their hind feet and beaverlike tail.
Scientific 3	These **Au*s*tralian mammal*s*** are bottom **feeder*s***. They ***s*coop** up **in*s*ect*s*** and larvae, shellfish, and **worm*s*** in their bill along with **bit*s*** of gravel and mud from the bottom.
Scientific 4	A mother typically **produce*s*** one or two **egg*s*** and **keep*s*** them warm by holding them between her body and her tail. The eggs hatch in about ten **day*s***, but **platypu*s* infant*s*** are the ***s*ize** of lima **bean*s*** and totally **helple*ss***.
Dramatic 1	You wouldn't believe what **ju*s*t** happened! I was just sitting here ***s*tudying**, and it was getting pretty late, and I was going to go to bed here pretty ***s*oon**.
Dramatic 2	There were all these people in the **apartment*s* up*s*tairs** screaming out of the **window*s***; they **mu*s*t** have been trapped. I was scared that the fire might ***s*pread** down the ***s*treet** to my **pla*c*e** too.
Dramatic 3	You know that ***S*panish** student down the hall from me? Later, he told me he heard the owner ***s*et** the fire **him*s*elf**. The whole thing was a big ***s*cam** to get the **insuran*c*e** money.

Note: Tokens of [s] that were used in the analysis are italicized within the boldfaced words.

For comparability, I decided to use only speech from the portion of the interview where the speakers recounted their mission experiences. Furthermore, I only choose excerpts of their speech that didn't contain any lexical or topical content that would hint at their sexual self-identification, so as to reduce any chance of them being judged as sounding gay or straight based on what they said instead of how they sounded. In order to find a similar amount of tokens (n=20) in the spontaneous speech, I listened to chunks of the interview (around 15 seconds per chunk) and noted the number of tokens of [s] in that chunk, which did not contain any lexical or subject content that would hint at the speaker's sexuality. This proved to be difficult for some of the participants as some of them only had five minutes of actual spontaneous speech from which I was working.

Once I had done this for the entire section where the speakers talked about their mission, I chose four 10-second excerpts that had the most tokens of [s] and transcribed the speech. I then counted the number of phonetic [s] for each section and used the three with the most

tokens of [s] (approximately 20 for each speaker) for the 30-second audio sample. Table 3.4 shows an example of some of the excerpts that were taken from the spontaneous speech about the speakers' missions.

3.4.2 Language attitudes and speech perception survey

Using online survey creation software (Widgix, LLC 2014), a survey was created with the 42 30-second clip audio files. Since the the participants were recorded using one-sided stereo (i.e., their microphone was plugged into the right audio jack and mine was plugged into the left stereo jack, their signal is only heard from the right headphone), I used Audacity (Audacity 2014) to create mono versions of audio to be used in the survey.

The survey was available online and the link was sent out freely to anyone who expressed interest in participating. Before listeners were able to consent to participating in the experiment, they were told that they had to be 18 years of age to participate (Appendix G). If they answered no to a question asking if they were 18 years of age or older, they were redirected to a page that thanked them for their interest. Listener's were also highly encouraged to wear headphones or earbuds in order to participate in the study (Appendix G). The consent form (Appendix G) informed the listeners what the study was about and informed them of the compensation (the chance to win one of four $20 Amazon gift

Table 3.4: Excerpts from spontaneous speech

Passage	Text
GM1	***S*eeing** that people are cool that are not **member*s*** because like the **nonmember*s*** that I grew up around were like ***s*uper** weird and ***s*uper** like anti-Mormon.
GM3	He never **mi*s*treated** me, ***s*pecifically**, but he **mi*s*treated *s*ome** of my **companion*s*** and it **pi*ss*ed** me off. You know, ***s*o** I didn't, I didn't, uh I thought he was a good president and not **ne*ces*sarily *s*uch** a great guy.
GM6	I don't know, **everyone'*s*** **ju*s*t** mad. Everyone **ju*s*t hate*s*** everyone and they're all **Bapti*s*t** too. But, they're **ju*s*t** like the **mo*s*t** the **mo*s*t** evil **Bapti*s*t** I've ever met, ***s*o**.
SM2	It- I was very ***s*ort** of **per*s*onality** wise very ***s*elf-contained**, ver- very ***s*elf**- um, not involved, but like ***s*elf-sustaining** if.
SM6	I **gue*ss*** **frustration*s*** with **lazine*ss* that'*s*** eh **that'*s*** a part of Polynesian culture um **there'*s*** like a **sen*s*e** of ***s*elf-entitlement almo*s*t**.
SM7	Mm-hm, yeah, it was always something that I wanted to do, I mean, **ju*s*t**, **ju*s*t** for the fact, you know, I thought it would be good to ***s*erve** people, like a learning **experien*c*e** and ***s*omething** to help me grow.

certificates).

Listeners consented to take part in the study by clicking Next on the consent page where they then had the chance to provide an e-mail address for the Amazon gift card drawing (Appendix G). Listeners were then presented with the instructions for the experiment (Appendix G). For the experiment, listeners were presented with 14, 30-second audio clips across three sections. The sections were actually the three styles. Listeners were presented first with the 14 audio clips from the scientific reading, then the dramatic reading, and finally the spontaneous speech samples. The 14 speakers were randomized for each section (see Table 3.5).

After the instructions, there were two practice questions that used my voice. The experiment was set up with an audio page (Appendix G) and a judgment tasks page (Appendix G) for each of the 42 audio clips. Listeners would arrive at the audio page and the audio would start playing automatically. The page was timed to only show for the duration of the audio clip.

Once the timer ran out, the page would automatically go to the judgment tasks page where the listener had 20 seconds to make judgments about the speech they heard on the previous page across 10 characteristics on a five-point Likert scales. These characteristics were gay/straight, polite/rude, educated/uneducated, feminine/masculine, and Mormon/non-Mormon. The options given on the Likert scale can be found in Table 3.6.

Between each section, listeners were offered a one-minute break, which they could skip.

Table 3.5: Order of audio clips presented to listeners

style	Speaker Code	style	Speaker Code	style	Speaker Code
Scientific	SM6	Dramatic	GM4	spontaneous	GM1
	GM4		GM1		SM3
	SM2		SM4		SM2
	SM3		SM1		GM3
	GM7		GM2		SM1
	GM3		SM3		GM4
	SM5		SM5		SM4
	SM1		GM3		GM7
	GM1		SM7		GM6
	SM4		GM7		SM6
	GM6		SM2		GM2
	GM5		GM6		GM5
	SM7		GM5		SM5
	GM2		SM6		SM7

Table 3.6: Option of response to characteristics in language attitudes and speech perception experiment

1- sounds definitely x[1]
2- sounds somewhat x
3- sounds in between x and y[2]
4- sounds somewhat y
5- sounds definitely y

1. x stood for gay, polite, educated, feminine, and Mormon
2. y stood of straight, rude, uneducated, masculine, and non-Mormon

They were presented with the directions again to keep them on task and to help prevent survey fatigue. At the end, listeners were told they had completed the experiment and were thanked for their participation.

3.4.3 Acoustic analysis

The audio that was presented to the listeners in the perception experiment was coded using Praat (Boersma & Weenink 2013). Two tiers were created in Praat (see Figure 3.3), a word tier and a segment tier. On the word tier, words that contained the target tokens of [s] were identified, boundaries were created for the word and the word transcribed.

On the segment tier, boundaries for onset and offset (see Figure 3.4) of [s] were created and the [s] was given a token number for that particular speech sample. Following the example from Haley et al. (2010):

> The onset and offset of voiceless fricative segments were determined visually based on continuous aperiodic energy in the wide-band spectrographic analysis as well as onset and offset of periodicity in the surrounding vowel segments. When both aperiodic and periodic energy occurred, the fricative segment boundaries were set so that any region of periodicity was avoided. The duration of the fricative segment was defined as the difference in milliseconds between the second and the first segmentation point. (550)

The preceding and following phonetic environments of the [s] were also included before and after the word, so that the Praat script could easily print them out with the rest of the results.

A Praat script (Appendix I) that uses an "analysis of statistical moments" (Zimman 2012:42), which gives statistical analysis of the distribution of acoustic energy within the sound was used to determine the spectral center of gravity (moment 1) and spectral skew

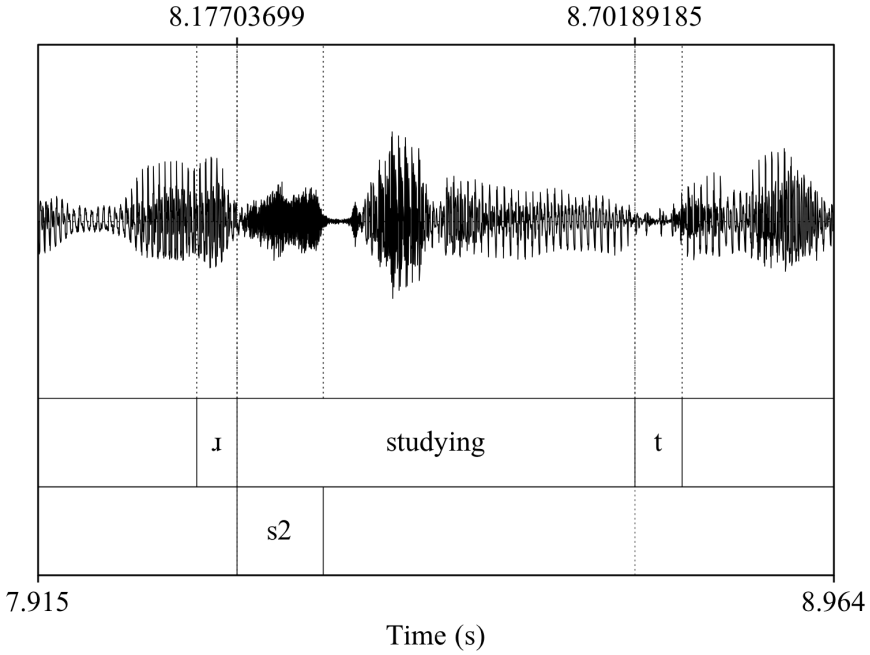


Figure 3.3: The waveform and TextGrid for the word "studying" from speaker GM3 during the dramatic reading.

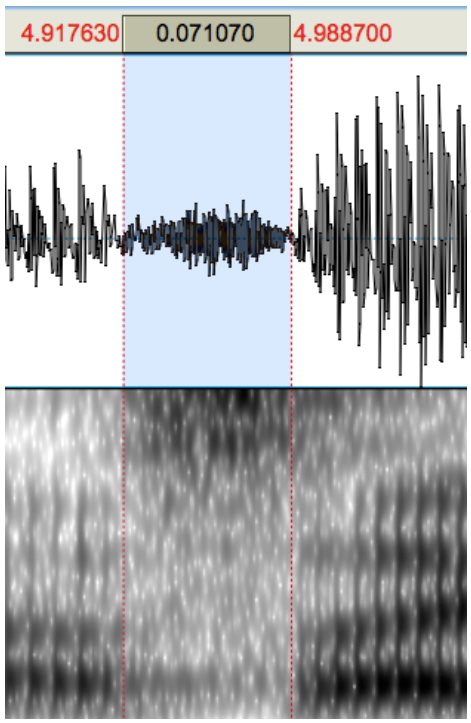


Figure 3.4: The onset and offset for [s] in the word "so," produced by GM3 during his spontaneous speech sample.

(moment 2). The script also determined the highest peak frequency, mean duration, and highest amplitude of each of the [s] tokens. The mean duration was excluded from any of the statistical analysis, since the tokens of [s] that were analyzed were taken from multiple environments within a given word (i.e., tokens were found as word initial, medial, and final). The rate of speech, location of the sound within the word, stress, emphasis, and intonation, to name a few, make it extremely difficult to study durations of a sound (Di Paolo et al. 2011).

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Gender questionnaire and percpetion results

The individual responses from the 14 particpants of the childhood gender questionnaire and the 36 participants in the perception experiment were entered into SPSS, statistical software (IBM Corp. 2012). A mixed effects analysis[1] (see Table 4.1) was performed with judgments of voices sounding gay or straight from the perception experiment as the dependent variable, and actual orientation, style, and responses to the childhood gender questionnaire as the independent variables. To account for the repeated measures in the data, I included a random intercept for speakers and one for judgers. I used bootstrapping in the analysis to avoid having to have residuals that are normally distributed and homoscedastic.

Though this study's focus is not on actual orientation, it is included as an extraneous variable to test what effects, if any, it may have on the judgments of the speech. Straight (actual orientation) was set as the 0 value. Table 4.1 (and also Table 4.2) gives the estimate for gay (actual orientation) to be -.356002, which, as a negative number, indicates that participants self-identifying as gay were more likely to be judged as sounding gay (1 on the Likert scale) and participants that self-identified as being straight were more likely to be judged as sounding straight (5 on the Likert scale) (see Figure 4.1).

When spontaneous speech was set as the 0 value, there was no significant interaction between the dramatic read speech and the perception of the speech being gay or straight (see Table 4.1). There was also no significant interaction between the spontaneous speech and the judgments when dramatic read speech was set as the 0 value (see Table 4.2). This shows that the spontaneous and dramatic read speech styles were not significantly different, which was also found in Jacobs et al. (2000). However, when either the spontaneous or the dramatic read speech were set as 0 value, the scientific read speech was found to positively

[1]The SPSS syntax that was used to get these results can be found in Appendix H.

Table 4.1: Mixed effect analysis of judgments compared with actual orientation, style, and results from the childhood gender questionnaire, with spontaneous speech set to 0

Parameter	Estimate	Bootstrap[a]				
		Bias	Std. Error	Sig[b]	95% Confidence Interval	
					Lower	Upper
Intercept	1.647962	.004575	.246866	.001	1.169567	2.132272
Gay	-.356002	.000900	.056988	.001	-.466089	-.238457
Straight	0	0	0	0	0	
Dramatic	.034854	-.001499	.062245	.565	-.090157	.157846
Scientific	.255935	-.004558	.063796	.001	.124645	.380904
Spontaneous	0	0	0	0	0	
Gender Socialization	.525220	-.001063	.070650	.001	.388168	.662502

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples
b. Significance is 2-tailed

Table 4.2: Mixed effect analysis of judgments compared with actual orientation, style, and results from the childhood gender questionnaire, with dramatic speech set to 0

Parameter	Estimate	Bootstrap[a]				
		Bias	Std. Error	Sig[b]	95% Confidence Interval	
					Lower	Upper
Intercept	1.682816	.001202	.241236	.001	1.185711	2.141444
Gay	-.356002	.001028	.056677	.001	-.462011	-.246454
Straight	0	0	0	0	0	
Dramatic	0	0	0	0	0	
Scientific	.221081	-.000961	.059344	.001	.106424	.336921
Spontaneous	-.034854	.001213	.064058	.584	-.161951	.095714
Gender Socialization	.525220	1.181032E-5	.069073	.001	.392723	.665095

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples
b. Significance is 2-tailed

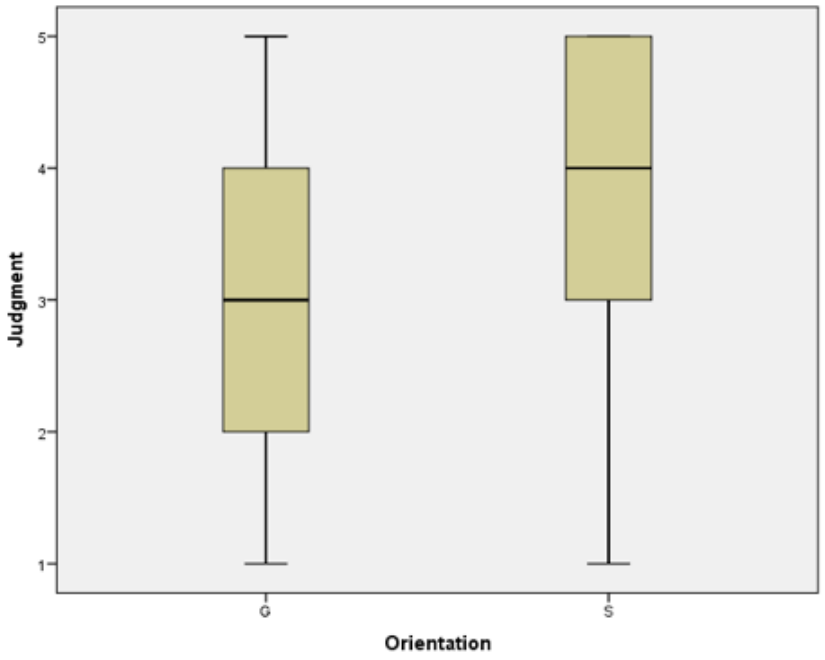


Figure 4.1: The relationship between the judgments of participants as sounding gay or straight (1-gay, 5-straight) and their actual orientation. G represents the self-identified gay participants and S represents the self-identified straight participants.

interact with the judgments, meaning that judgments on the voices were more straight during the scientific read speech than judgments on the spontaneous and dramatic read speech (see Tables 4.1 and 4.2). In other words, all participants were judged as being relatively more straight during the scientific read speech than the other two styles of speech (see Figure 4.2).

Table 4.3 shows the average mean score of the responses for the childhood gender questionnaire for each participant from lowest average mean score to highest. A lower score reflects nonconformity to societal gender norms, whereas a higher score reflects conformity to societal gender norms. GM1's responses on the questionnaire reflected responses typical of that of children who self-identify as female (Zucker et al. 2006) and being relatively closer to his mother than his father. Speaker SM6's responses on the questionnaire reflected responses typical of that of children who self-identify as male (Zucker et al. 2006) and being relatively closer to his father than his mother.

Gender socialization (the results from the early childhood gender questionnaire) when considered in the mixed effects model (see Tables 4.1 and 4.2) interacted positively and is significant at the .001 level. What this means is that when responses on the recalled early childhood gender questionnaire reflected nonconformity to societal gender norms,

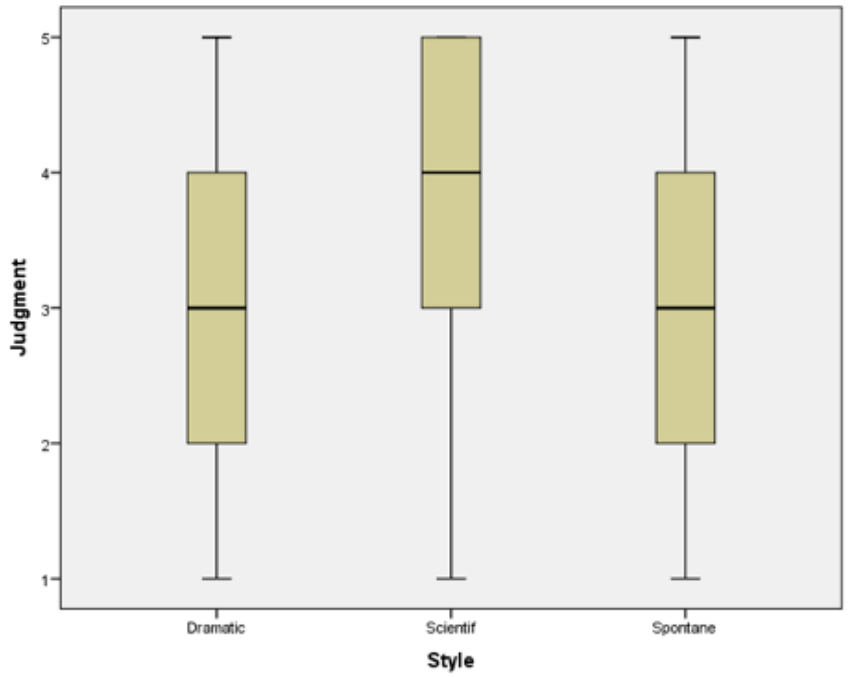


Figure 4.2: The relationship between the judgments and the three styles of speech. Estimated means: Dramatic: 3.20, Scientific: 3.42, Spontaneous: 3.17

Table 4.3: Socialization survey results

Speaker	**Average Mean Score**
f GM1	2.59
GM6	3.045
GM5	3.33
GM2	3.47
GM7	3.56
SM4	3.63
GM4	3.65
SM1	3.78
SM5	3.78
SM3	3.89
GM3	3.90
SM2	3.94
SM7	4.13
SM6	4.5

the judgments of the speech were gay. When the responses on the recalled early childhood gender questionnaire reflected conformity to societal gender norms, the judgments of the speech were straight (see Figure 4.3).

Table 4.4 shows the rankings and mean scores of judgments per speaker across the three styles. Speakers GM1 and GM7 were consistently perceived as sounding the most gay in all three speech styles, whereas speakers GM3 and SM7 were consistently perceived as sounding the most straight across the three speech styles. While reported sexual orientation significantly influenced listener judgments, Table 4.4 shows that some individuals were perceived as sounding like the other end of the spectrum. Both speakers GM5 and GM3 were consistently judged as sounding more straight and SM1, was judged as sounding gay.

4.2 Results of acoustic analysis

Using SPSS, a mixed effects analysis was performed with judgments of voices sounding gay or straight from the perception experiment as the dependent variable and actual orientation, style, highest average frequency, average spectral skew, and average spectral center of gravity as the independent variables. The highest amplitude and average spectral center of gravity were highly correlated and could not be included together in the mixed

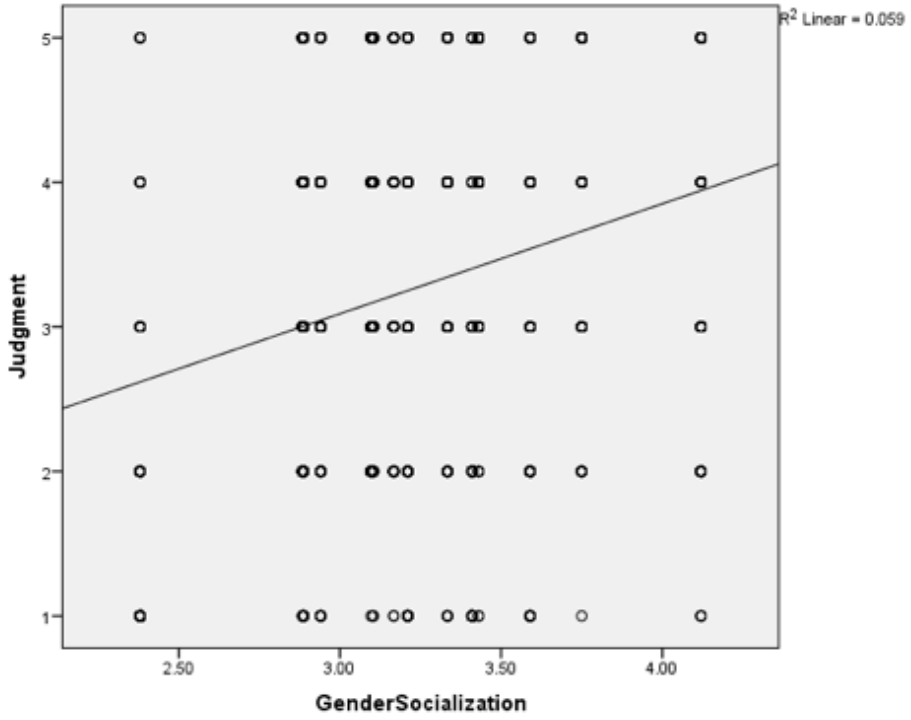


Figure 4.3: The positive relationship between the results of the recalled early childhood questionnaire and judgments of the voices as sounding either gay or straight.

Table 4.4: Mean score of judgments by style

Dramatic		Scientific		Spontaneous	
Speaker	**Mean Score**	**Speaker**	**Mean Score**	**Speaker**	**Mean Score**
GM1	1.69	GM1	1.71	GM1	1.89
GM7	2.34	GM7	2.31	GM7	1.91
GM4	2.89	GM2	2.89	SM1	2.51
GM6	3.03	GM6	3.24	GM2	2.68
SM1	3.09	SM4	3.32	GM6	2.82
GM2	3.21	SM1	3.41	GM4	3.27
SM2	3.26	SM2	3.70	SM3	3.29
SM6	3.26	GM5	3.71	GM5	3.31
SM4	3.35	SM3	3.79	SM4	3.40
GM5	3.40	GM4	3.85	SM6	3.50
SM5	3.59	SM5	3.88	SM2	3.60
SM3	3.71	SM6	4.06	GM3	4.03
SM7	3.88	SM7	4.14	SM5	4.06
GM3	4.11	GM3	4.21	SM7	4.06

affects analysis. Therefore, I ran the analysis separately, each with average spectral skew (see Tables 4.5, 4.6, and 4.7). To account for the repeated measures in the data, I included a random intercept for speakers and one for judgers. I used bootstrapping in the analysis to avoid having to have residuals that are normally distributed and homoscedastic.

Tables 4.5, 4.6, and 4.7, which are showing the interaction of actual sexual orientation with the perception of speech, reflect previous analysis (see Tables 4.1 and 4.2). The same can be said for style. There was no significant effects of average spectral center of gravity and highest average frequency on the judgments of the voices being perceived as gay or straight (see Table 4.5). The effect of average spectral skew and highest amplitude shows a negative interaction with the judgments and is significant (see Tables 4.5, 4.6, and 4.7). The higher the average amplitude and more negatively skewed the [s], the more likely a voice was judged as sounding straight. The lower the average amplitude and the less negatively skewed the [s], the more like a voice was judged as sounding gay. These findings contradict my hypothesis, as well as findings in previous studies on sibilant skew (Munson et al. 2006; Munson 2007; Zimman 2010, 2013), that those who are perceived as sounding gay will have significantly higher amplitude in [s] and more negatively skewed [s].

Why was there a significant negative interaction between the average spectral skew, highest amplitude, and the judgments? The average spectral skew by speaker (Figure 4.4)

Table 4.5: Mixed effect analysis of judgments with orientation, style, average spectral skew, and average highest spectral center of gravity

Parameter	Estimate	Bootstrap[a]				
		Bias	Std. Error	Sig[b]	95% Confidence Interval	
					Lower	Upper
Intercept	3.510100	-.000621	.078171	.001	3.366323	3.664940
Gay	-.581173	.000109	.013904	.001	-.609069	-.554074
Straight	0	0	0	0	0	
Dramatic	-.007708	.000647	.053062	.890	-.110220	.092018
Scientific	.28139	.000414	.014114	.001	.253837	.310923
Spontaneous	0	0	0	0	0	
Average Spectral Skew	-.010775	-.000151	.003669	.010	-.018046	-.003973
Average Spectral COG	-3.184779E-6	-6.863730E-11	3.688805E-6	.395	-1.053076E-5	3.895394E-6

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples
b. Significance is 2-tailed

as compared with listener's judgments (Figure 4.5) show some outliers of those who fall in both the self-identified and perceived straight-sounding group. While SM2, and SM5, who both self-identify as straight and were, on average, perceived to sound straighter than 64% of the other participants, both have very low means for spectral skew. The fact that some of those who were judged as sounding straight also had more negatively skewed [s] than those who were judged as sounding gay, may explain why I got these results.

None of the information that was discussed during the interviews even hints as to possible reasons why SM2 and SM5 would have more negatively skewed [s] and higher amplitude. While the results of each of the participant's score from the Kinsey Scale (the scale that measures "gayness" and "straightness") (see Table 3.1) was not included in the statistical analysis, there is an interesting interaction between the Kinsey score with these results. While the self-identified gay participants were more heterogeneous in identifying their sexual orientation, the straight men were more homogenous, except for SM2 and SM5, who both identify as "predominantly heterosexual, only incidentally homosexual," while all the others identify as "exclusively heterosexual with no homosexual." The fact that SM2 and SM5 are the only two who deviate from the answers given by the other straight-identified participants may give a glimpse as to what is happening with the results from the acoustic analysis.

Table 4.6: Mixed effect analysis of judgments with orientation, style, average spectral skew, and average highest amplitude

Parameter	**Estimate**	**Bootstrap**[a]				
		Bias	**Std. Error**	**Sig**[b]	**95% Confidence Interval**	
					Lower	**Upper**
Intercept	3.364204	.000184	.042086	.001	3.280494	3.447141
Gay	-.57313	1 -2.848332E-005	.014549	.001	-.601679	-.544972
Straight	0	0	0	0	0	
Dramatic	.084551	.000192	.032565	.009	.020991	.149434
Scientific	.282250	-.000256	.014804	.001	.251224	.309378
Spontaneous	0	0	0	0	0	
Average Highest Amplitude	.001085	9.080256E-007	.000502	.036	.000102	.002142
Average Spectral Skew	-.009531	7.289018E-005	.003561	.007	-.016800	-.002880

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples
b. Significance is 2-tailed

Table 4.7: Mixed effect analysis of judgments with orientation, style, average spectral skew, and average highest peak frequency

Parameter	Estimate	Bootstrap[a]				
		Bias	Std. Error	Sig[b]	95% Confidence Interval	
					Lower	Upper
Intercept	3.378918	.000167	.038955	.001	3.303924	3.459525
Gay	-.578794	1.392679E-005	.013464	.001	-.606381	-.553003
Straight	0	0	0	0	0	
Dramatic	.031141	.000599	.018447	.081	-.003586	.068890
Scientific	.275945	.000300	.014341	.001	.248683	.305239
Spontaneous	0	0	0	0	0	
Highest Average Frequency	1.040878E-005	-9.866685E-008	5.432124E-006	.053	-4.120042E-007	2.089463E-005
Average Spectral Skew	-.009236	-.000145	.003457	.015	-.016289	-.002702

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples
b. Significance is 2-tailed

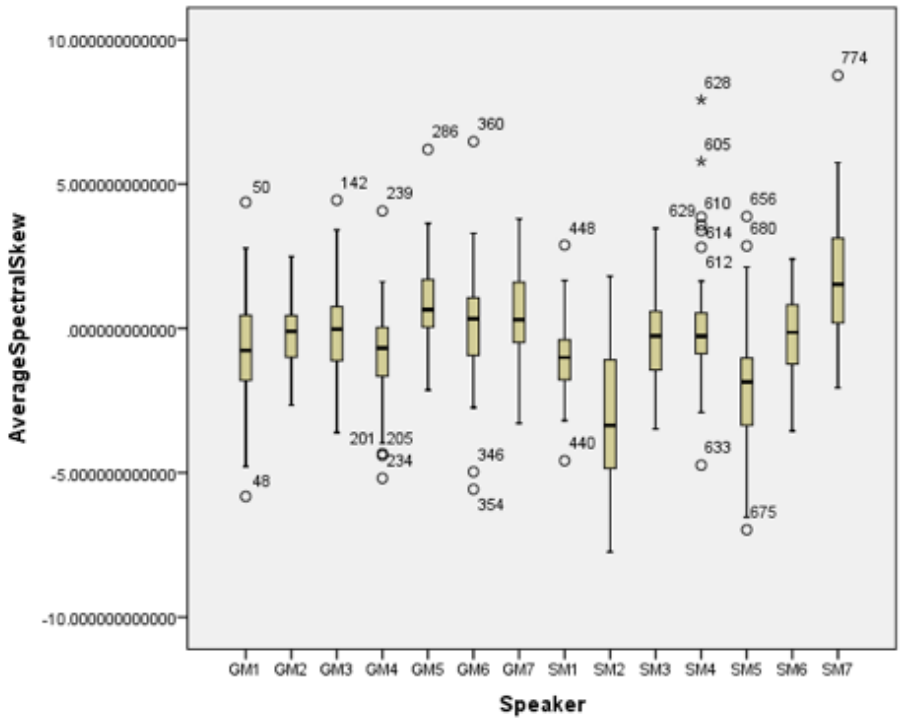


Figure 4.4: The average spectral skew by speaker.

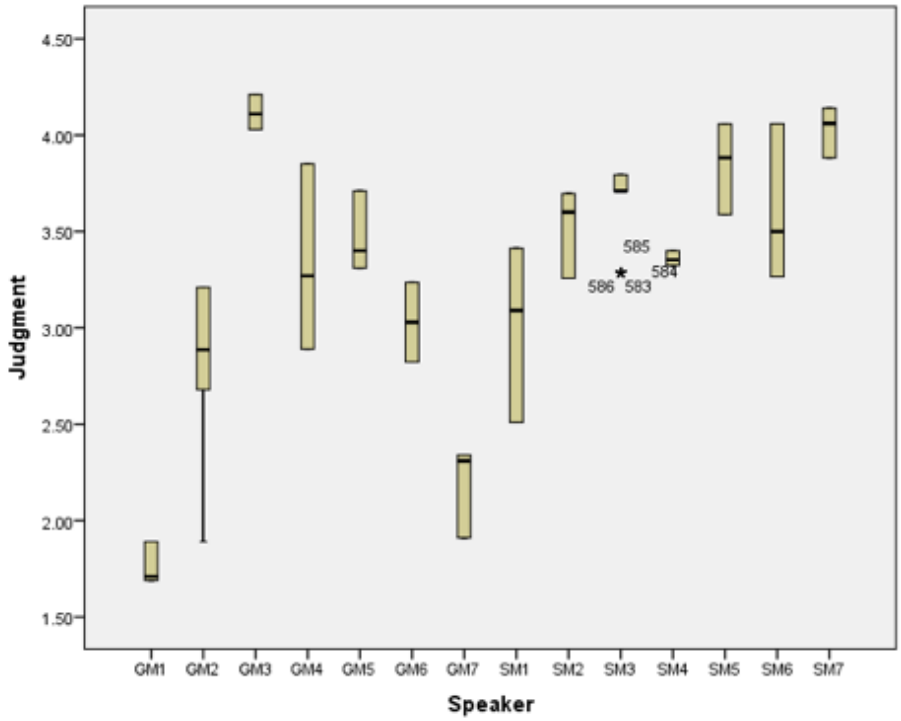


Figure 4.5: This scatter plot shows the judgment of speech by speaker.

The results of the interaction of the average spectral skew with judgments of speech as sounding gay or straight is puzzling, given earlier studies. An explanation for it may be hidden somewhere in a variable that was not considered. Another possibility is that, given the homogeneity of the average spectral skew except for a few outliers, this may be unique to my population or to their dialect. Another explanation may be that negatively skewed [s] simply is not an indicator of gay- or straight-sounding speech.

CHAPTER 5

CONCLUSION

Though there exists a vast literature on language and sexuality, especially on the speech of gay and straight men, the results have shown to be contradictory. While early research focused on studying gay and straight speech based on self-identified sexual orientation, recent research has focused on the perception of speech to find out what "gay" and "straight" speech actually means. Reasons why some men grow up to sound gay and some straight have been attributed to gay men acquiring female acoustic features, belonging to a larger gay or heterosexual community, and to early childhood gender socialization.

This study explored how gender socialization and the acoustics of [s] influence the perception of voices sounding straight and gay, utilizing a matched-guise language attitudes and speech perception experiment. By recruiting a speaker-participant group comprised of LDS returned missionaries that were raised in the LDS church and grew up within 20 miles of the Salt Lake Valley, it was possible to control for regional origin, age, similar life stages, and heteronormative gender socialization.

This study found that not all gay men sound gay and not all straight men sound straight and in fact some straight men sound gay and vice versa. It was found that when participants reported on the recalled early childhood gender identity/role questionnaire that they conformed to societal gender norms during childhood, they were judged as sounding straight during the perception experiment. On the other hand, those participants that reported on the questionnaire that they did not conform to societal gender norms during childhood, they were judged as sounding gay.

When it came to the style of speech, only the scientific read speech interacted significantly with judgments. Overall, participants were judged as sounding "straighter" when their voice from the scientific read speech style was being considered. The acoustic results showed that only average spectral skew and average highest amplitude interacted significantly with whether or not a voice is judged as sounding gay or not. This interaction is in the opposite direction that was hypothesized. Instead of perceived gay speech having

more negatively skewed [s] and higher amplitudes in [s], the speech that was perceived as being gay had less negative skewed [s] and lower amplitudes than the speech that was perceived as being straight. The reasons for these results may be hidden within extraneous variables that are not considered and with further study, using the data collected in this study, it might be possible to gain an understanding of what is exactly at play when a listener judges a voice as sounding either gay or straight.

For future research, it would be interesting to see how the geographical origin or whether or not someone has lived in Utah for a significant amount of time or not influences judgments on speech. Because the acoustic results were unexpected, it might be necessary to interview female speaker-participants and compare their average spectral skew and average highest amplitude to see if these results are related to the LDS population, or if it is some other variable that is playing a role. Looking into an alternative approach to analyzing the acoustics of sibilants may also yield different results.

Interdisciplinary methodologies are key to understanding language and sexuality. While the results of the judgments and responses from the gender socialization questionnaire interacted significantly, other types of psychometric questionnaires and also understanding levels of outness might give even better fine tuned results. A longitudinal study design following a group of pre-adolescents into adulthood and recording them every year across the whole time of the study, as well as using ethnographic approaches to studying language and socialization, may be the best method to understanding how one grows up to speak the way they do.

APPENDIX A

SOCIOLINGUISTIC INTERVIEW QUESTIONNAIRE

A.1 Demographic questions

A.1.1 Instructions

"So again, this study is about gender socialization and this interview will help me learn about you and your gender socialization growing up. In the first part of the interview, I'm going ask you about who you are and what your life was like growing up in general. I'm then going to have you read two passages for me and ask you some questions about each passage. I will then hand you a questionnaire called the 'Childhood Recalled Gender Socialization Questionnaire' that I'll have you fill out. After you have completed this, I will continue the interview and ask you questions that are more centered around your romantic attractions and relationships. Try to be as thorough as possible in answering each question and do not hesitate to elaborate on details. I want to understand everything about you as best as I can. If at any point you need to take a break from the questions or you don't feel comfortable answering the questions let me know and we can skip that question. If you want to stop the interview at any point, let me know and we will. Your name and identity will not be associated with anything that we talk about here today and will be kept completely confidential."

A.1.2 Questions

1. What year were you born?
2. Where were you born?
    (a) How long have/did you live(d) t/here?
3. Where do you live now?
    (a) How long have you lived t/here?

4. Where else have you lived since birth up to today and how long in each place?
5. You grew up LDS, correct?
6. Was the neighborhood you grew up in largely LDS? What percentage (estimate)?
7. Where was your mother born and where did she grow up?
8. Where was your father born and where did he grow up?
9. Did your parents grow up LDS?
10. Are you parents still married?
    (a) When did they separate? (If they did)
11. Where do your parents live now?
12. What do your parents do for a living?
13. Did they always do this line of work?
14. (If both parents have always worked) Who took care of you when you were growing up?
15. Do you know much about your family's background in terms of national ancestry, where you come from?
16. Was any other language besides English spoken in your home while growing up?
17. Do you have any brothers and sister, if so, how many?
    (a) Are they older or younger? Where do you fall in the line?
18. Where do they all live now?
19. Are all of them still actively LDS?
    (a) Who is and who isn't and when did they leave the church?
20. Are you especially close to any of your siblings?
    (a) If you are close to some of them, what do you think it is that makes you close to them?

21. Were you always close to this sibling, growing up?

    (a) What are some of the memories you have of your closeness with them growing up, from your earliest memory to even today.

22. How were your parents in terms of discipline and strictness, while you were growing up?

23. What kind of relationship did you have with your grandparents growing up?

24. Are they LDS?

25. Do you still have the same kind of relationship with your grandparents?

26. Did you attend public schools, private schools, or were you home schooled?

27. What were some of your favorite subjects in school growing up?

28. What extra-curricular activities did you do?

29. Who were the people you hung out with at school? Outside of school?

30. How old were you when you started primary?

31. What percentage of your schools (students) were LDS? What percentage of the teachers were LDS?

32. Was your best friend($^{(\prime)}$s)$^{(\prime)}$ family a part of your ward[1]?

33. Were you in the Boy Scouts?

34. Did you receive the Aaronic Priesthood?

35. At 14 did you become a teacher?

36. At 16 did you become a priest?

37. Did you receive Melchizedek Priesthood?

38. Did you go through the Temple?

39. Did you go on a mission?

[1]A ward is the larger of two geographical congregations in The Church of Jesus Christ of Latter-day Saints, the smaller being a branch.

40. Where did you go?

41. Tell me about your experience as a missionary starting from the moment you found out that you were called to finding out where you were going, to MTC, to your relationships with each of your companions.

42. Was there ever a time where you were really scared during your mission? Tell me about it.

43. What was your favorite part about serving a mission and your least favorite part; please explain.

44. Did you or do you go to college?

    (a) What are/did you study(ing)?

    (b) Are you part of any clubs or extra-curricular activities at or outside of the university?

    (c) What do you want to do with your degree?

45. What do you do in your free time?

46. What are your hobbies and interests?

47. Do you work?

    (a) What do you do?

A.2 Relationship and sexuality questions

A.2.1 Instructions

"Ok, so this is the last section. Since this study is focusing on the socialization of different males who were raised LDS, I'm interviewing those who identify as experiencing same-gender attraction as well as those who identify as being heterosexual. These questions will ask you about your attractions and romantic relationships growing up. Again, try to be as thorough as possible in answering each question and do not hesitate to elaborate on details. I want to understand everything about you as best as I can. If at any point you need to take a break from the questions or you don't feel comfortable answering the questions let me know and we can skip that question. If you want to stop the interview at any point, let me know and we will. Your name and identity will not be associated with anything that we talk about and will be kept completely confidential."

A.2.2 Preliminary questions

1. Do you identify as a biological male, meaning you were born a biological male and feel that you belong in that body (i.e., you do not identify as transgender)?
2. Have you ever experienced same-gender attraction?
    (a) If no, go below to the questionnaire for those who identify as straight.
    (b) If yes, ask: How do you identify yourself?
        i. If they do not identify as straight (i.e., they identify as gay/bi/queer/et.c, go below to the questionnaire for those who identify as gay/bi).
        ii. If they say they identify as straight, go below to the questionnaire for those who have experienced same-gender attraction.

A.2.3 Questions for straight-identified participants

1. When was the first time you ever felt attracted to someone?
2. When was your first crush?
3. When did you have your first girlfriend?
4. When was your first date?
5. How many girlfriends do you think you have had over your lifetime?
6. Did your parents talk to you about sex and about dating?
7. Who talked to you about it, your mom or dad?
    (a) If both, what did each of them talk about?
8. Did you ever talk about sex and dating with anyone else besides your parents, in any capacity?
9. Are you married now? Tell me about how you and your wife met, etc.
10. Were you married in the Temple?
11. Do you have any kids?
    (a) Boys, girls?
    (b) How old?

12. In your opinion, do you think you sound straight when you speak?
13. Do you think you sound masculine?
14. Do you think you ever sound feminine?
15. Have you ever intentionally tried to mimic a woman? What did that sound like, can you give me an example?
16. Have you ever intentionally tried to mimic someone who was gay? What did it sound like?
17. In your opinion, what does a stereotypical gay sounding man sound like?
18. Has anyone ever mentioned that you might sound gay?
19. In your opinion, what does a stereotypical straight sounding man sound like?
20. Do you remember ever consciously making the decision to act or sound more masculine while growing up? If so, in what situation?
21. Were you ever made fun of for the way you acted or sounded? If so, can you explain what it was like?
22. Do you choose to sound the way you do?
23. Are you happy with the way your voice sounds?

A.2.4 Questions for gay-identified participants

1. When was the first time you ever felt attracted to someone.
2. Was it a boy or a girl?
3. Were you ever attracted to boys/girls (depending on their answer above)?
4. When was the first time for that?
5. When was your first crush?
6. Was it a girl or a boy?
7. When was the first time for that?
8. When was the first time you realized that you were gay? (Explain)

9. Are you out? If so, to whom?
10. Tell me what it has been like for you from realizing that you were attracted to the same sex up until today. Especially about your relationship with your family, friends, and church.
11. When did you first come out?
12. Tell me about some of your coming out experiences, were they positive or negative experiences?
13. Have you ever had a boyfriend? Tell me about it.
14. Have you ever had a girlfriend?
15. When was your first date with a boy/girl?
16. How many boyfriends do you think you have had over your lifetime? Tell me about them.
17. How many girlfriends do you think you have had over your lifetime? Tell me about them
18. Did your parents talk to you about sex and about dating?
19. Who talked to you about it, your mom or dad?
    (a) If both, what did each of them talk about?
20. Did you ever talk about sex and dating with anyone else besides your parents, in any capacity?
21. Have you ever been married?
22. Were you married in the Temple?
23. Do you have any kids?
    (a) Boys, girls?
    (b) How old?
24. In your opinion, do you think you sound gay when you speak?

25. Do you think you sound masculine?
26. Do you think you sound feminine?
27. Have you ever intentionally tried to mimic someone who was straight? What did it sound like?
28. Have you ever intentionally tried to mimic someone who was gay? What did it sound like?
29. In your opinion, what does a stereotypical gay sounding man sound like?
30. In your opinion what does a stereotypical straight sounding man sound like?
31. Has anyone ever mentioned that you sound gay?
32. Has anyone ever mentioned that you sound straight?
33. Do you remember ever consciously making the decision to act or sound more masculine while growing up? If so, in what situation?
34. Do you remember ever consciously making the decision to act or sound more feminine while growing up? If so, in what situation?
35. Were you ever made fun of for the way you acted or sounded? If so, can you explain what it was like?
36. Do you choose to sound the way you do?
37. Are you happy with the way your voice sounds?

A.2.5 Questions for participants who experience/have experienced same-gender attraction

1. When was the first time you ever felt attracted to someone.
2. Was it a boy or a girl?
3. Were you ever attracted to boys/girls (depending on their answer above)?
4. When was the first time for that?
5. When was your first crush?
6. Was it a girl or a boy?

7. When was the first time for that?
8. When was the first time you realized that you were gay? (Explain)
9. Are you out? If so, to whom?
10. Tell me what it has been like for you from realizing that you were attracted to the same sex up until today. Especially about your relationship with your family, friends, and church.
11. When did you first come out?
12. Tell me about some of your coming out experiences, were they positive or negative experiences?
13. Have you ever had a boyfriend? Tell me about it.
14. Have you ever had a girlfriend?
15. When was your first date with a boy/girl?
16. How many boyfriends do you think you have had over your lifetime? Tell me about them.
17. How many girlfriends do you think you have had over your lifetime? Tell me about them
18. Did your parents talk to you about sex and about dating?
19. Who talked to you about it, your mom or dad?
    (a) If both, what did each of them talk about?
20. Did you ever talk about sex and dating with anyone else besides your parents, in any capacity?
21. Have you ever been married?
22. Were you married in the Temple?
23. Do you have any kids?
    (a) Boys, girls?

(b) How old?

24. In your opinion, do you think you sound gay when you speak?

25. Do you think you sound masculine?

26. Do you think you sound feminine?

27. Have you ever intentionally tried to mimic someone who was straight? What did it sound like?

28. Have you ever intentionally tried to mimic someone who was gay? What did it sound like?

29. In your opinion, what does a stereotypical gay sounding man sound like?

30. In your opinion what does a stereotypical straight sounding man sound like?

31. Has anyone ever mentioned that you sound gay?

32. Has anyone ever mentioned that you sound straight?

33. Do you remember ever consciously making the decision to act or sound more masculine while growing up? If so, in what situation?

34. Do you remember ever consciously making the decision to act or sound more feminine while growing up? If so, in what situation?

35. Were you ever made fun of for the way you acted or sounded? If so, can you explain what it was like?

36. Do you choose to sound the way you do?

37. Are you happy with the way your voice sounds?

APPENDIX B

SCIENTIFIC READING PASSAGE

B.1 Instructions for the scientific reading passage (Platypus)

"Ok, here's an article" (hand them the Platypus article) "from National Geographic about an animal. I'd like you to read it out loud, pretending you are reading the article to a group of young children and are teaching them about this animal. I will then ask you some questions about it. Before you begin, take time to look over the passage before reading it out loud."

B.2 Platypus passage

"The platypus is among nature's most unlikely animals. In fact, the first scientists to examine a specimen believed they were the victims of a hoax. The animal is best described as a hodgepodge of more familiar species: the duck, beaver, and otter. Males are also venomous. They have sharp stingers on the heels of their rear feet and can use them to deliver a strong toxic blow to any foe.

Platypuses hunt underwater, where they swim gracefully by paddling with their front webbed feet and steering with their hind feet and beaverlike tail. Folds of skin cover their eyes and ears to prevent water from entering, and the nostrils close with a watertight seal. In this posture, a platypus can remain submerged for a minute or two and employ its sensitive bill to find food.

These Australian mammals are bottom feeders. They scoop up insects and larvae, shellfish, and worms in their bill along with bits of gravel and mud from the bottom. All this material is stored in cheek pouches and, at the surface, mashed for consumption. Platypuses do not have teeth, so the bits of gravel help them to "chew" their meal.

On land, platypuses move a bit more awkwardly. However, the webbing on their feet retracts to expose individual nails and allow the creatures to run. Platypuses use their nails and feet to construct dirt burrows at the water's edge. Platypus reproduction is nearly unique. It is one of only two mammals (the echidna is the other) that lay eggs.

Females seal themselves inside one of the burrow's chambers to lay their eggs. A mother typically produces one or two eggs and keeps them warm by holding them between her body and her tail. The eggs hatch in about ten days, but platypus infants are the size of lima beans and totally helpless. Females nurse their young for three to four months until the babies can swim on their own" (National Geographic 2012).

B.3 Platypus reading questions

Ask the following questions once they have read the narrative out loud:

- Do you think the young platypuses are socialized in the same manner as human children?
- Do you know of any children who spend their first four months primarily with their father?
- Do you think that has any lasting effects on their development?

APPENDIX C

DRAMATIC READING PASSAGE

C.1 Instructions for the dramatic reading, *Fire Passage* (Crist 1997)

"Ok, now here is a short narrative" (hand them the fire reading). "Read out loud like you are the character in the story and were talking to your family or your friends. I'll then ask you questions about it. Take your time to look over it first and let me know when you are ready."

C.2 *Fire Passage*

"You wouldn't believe what just happened! I was just sitting here studying, and it was getting pretty late, and I was going to go to bed here pretty soon. But then I started hearing these people screaming out in the street. So I got up, and I was going to yell out the window,"Will you please hold it down out there" But as soon as I poked my head out, I smelled smoke, and you know that ski store down at the end of the corner? It was all full of flames. There were all these people in the apartments upstairs screaming out of the windows; they must have been trapped. I was scared that the fire might spread down the street to my place too. Then I heard sirens screaming, and all these cop cars and fire trucks pulled up. The firemen went up on ladders and helped all the people get out. One girl looked like she had bad burns on her skin, and this other guy fell, and the ambulance guys had to put a splint on his leg. I could see the guys down on the ground; they were having some kind of problem with the fire hydrant, but they finally got the hoses hooked up to the spouts, and then they went up and poked a hole in the roof with a big metal kind of stick, and they sprayed tons and tons of water in. It took them better than two hours to get the fire out. You know that Spanish student down the hall from me? Later, he told me he heard the owner set the fire himself. The whole thing was a big scam to get the insurance money. Unbelievable!"

C.3 *Fire Passage* question

Ask the following question once they have read the narrative out loud:

- What gender do you think the character in this story was and why do you think so?

APPENDIX D

THE RECALLED CHILDHOOD GENDER IDENTITY/GENDER ROLE QUESTIONNAIRE

D.1 Instructions

"Ok, now here's a set of 23 questions that ask you about your behavior as a *child*, that is, the years '0 to 12.' For each question, circle the response that best describes your behavior as a child. Please note that there are no right or wrong answers."

D.2 Questionnaire

Please answer the following questions about your behavior as a *child*, that is, the years "0 to 12" years old. For each question, circle the response that best describes your behavior as a child. Please note that there are no right or wrong answers.

1. As a child, my favorite playmates were

   (a) always boys

   (b) usually boys

   (c) boys and girls equally

   (d) usually girls

   (e) always girls

   (f) I did not play with other children

2. As a child, my best or closest friend was

   (a) always boys

   (b) usually boys

   (c) boys and girls equally

   (d) usually girls

   (e) always girls

   (f) I did not have a best or close friend

3. As a child, my favorite toys and games were

   (a) always "masculine"

   (b) usually "masculine"

   (c) equally "masculine" and "feminine"

   (d) usually "feminine"

   (e) always "feminine"

   (f) neither "masculine" or "feminine"

4. Compared to other boys, my activity level was

   (a) very high

   (b) higher than average

   (c) average

   (d) lower than average

   (e) very low

5. As a child, I experimented with cosmetics (make-up) and jewelry

   (a) as a favorite activity

   (b) frequently

   (c) once-in-a-while

   (d) very rarely

   (e) never

6. As a child, the characters on TV or in the movies that I imitated or admired were

   (a) always girls or women

   (b) usually girls or women

   (c) girls/women and boy/men equally

   (d) usually boys or men

   (e) always boys or men

   (f) I did not imitate or admire characters on TV or in the movies

7. As a child, I enjoyed playing sports such as football, baseball, hockey, basketball, and soccer

   (a) only with boys

   (b) usually with boys

   (c) with boys and girls equally

   (d) usually with girls

   (e) only with girls

   (f) I did not play these types of sports

8. In fantasy or pretend play, I took the role

   (a) only of boys or men

   (b) usually of boys or men

   (c) boys/men and girls/women equally

   (d) usually of girls or women

   (e) only of girls or women

   (f) I did not do this type of pretend play

9. In dress-up play, I would

    (a) wear boys' or men's clothing all the time

    (b) usually wear boys' or men's clothing

    (c) half the time wear boys' or men's clothing and half the time wear girls' or women's clothing

    (d) usually wear girls' or women's clothing

    (e) wear girls' or women's clothing all the time

    (f) I did not do this type of play

10. As a child, I felt

    (a) very masculine

    (b) somewhat masculine

    (c) masculine and feminine equally

    (d) somewhat feminine

    (e) very feminine

    (f) I did not feel masculine or feminine

11. As a child, compared to other boys my age, I felt

    (a) much more masculine

    (b) somewhat more masculine

    (c) equally masculine

    (d) somewhat less masculine

    (e) much less masculine

12. As a child, compared to my brother [Note: If you had more than one brother, make your comparison with the brother closest to you in age], I felt

    (a) much more masculine

    (b) somewhat more masculine

    (c) equally masculine

    (d) somewhat less masculine

    (e) much less masculine

    (f) I did not have a brother

13. As a child, I

    (a) always resented or disliked my sister [Note: if you had more than one sister, make your comparison with the sister closest to you in age.]

    (b) usually resented or disliked my sister

    (c) sometimes resented or disliked my sister

    (d) rarely resented or disliked my sister

    (e) never resented or disliked my sister

    (f) I do not have a sister

14. As a child, my appearance (hair style, clothing, etc.) was

    (a) very masculine

    (b) somewhat masculine

    (c) equally masculine and feminine

    (d) somewhat feminine

    (e) very feminine

    (f) neither masculine or feminine

15. As a child, I

    (a) always enjoyed wearing dresses and other "feminine" clothes

    (b) usually enjoyed wearing dresses and other "feminine" clothes

    (c) sometimes enjoyed wearing dresses and other "feminine" clothes

    (d) rarely enjoyed wearing dresses and other "feminine" clothes

    (e) never enjoyed wearing dresses and other "feminine" clothes

16. As a child, I was

    (a) emotionally closer to my mother than to my father

    (b) somewhat emotionally closer to my mother than my father

    (c) equally close emotionally to my mother and my father

    (d) somewhat emotionally closer to my father than my mother

    (e) emotionally closer to my father than my mother

    (f) not emotionally close to either my mother or to my father

17. As a child, I

    (a) admired my father and mother equally

    (b) admired my father more than my mother

    (c) admired my mother more than my father

    (d) admired neither my mother nor my father

18. As a child, I had the reputation of a "sissy"

    (a) all of the time

    (b) most of the time

    (c) some of the time

    (d) on rare occasions

    (e) never

19. As a child, I

    (a) always felt good about being a boy

    (b) usually felt good about being a boy

    (c) sometimes felt good about being a boy

    (d) rarely felt good about being a boy

    (e) never felt good about being a boy

    (f) never really thought about how I felt being a boy

20. As a child, I had the desire to be a girl but did not tell anyone

    (a) almost always

    (b) frequently

    (c) sometimes

    (d) rarely

    (e) never

21. As a child, I would tell others I wanted to be a girl

    (a) almost always

    (b) frequently

    (c) sometimes

    (d) rarely

    (e) never

22. As a child, I

    (a) always felt that my mother cared about me

    (b) usually felt that my mother cared about me

    (c) sometimes felt that my mother cared about me

    (d) rarely felt that my mother cared about me

    (e) never felt that my mother cared about me

    (f) cannot answer because I did not live with my mother (or know her)

23. As a child, I

    (a) always felt that my father cared about me

    (b) usually felt that my father cared about me

    (c) sometimes felt that my father cared about me

    (d) rarely felt that my father cared about me

    (e) never felt that my father cared about me

    (f) cannot answer because I did not live with my father (or know him)

D.3 Follow-up questions

1. Was it easy to remember back to your childhood to answer these questions?

2. Did you feel uncomfortable about answering any of the questions, if so, which?

APPENDIX E

KINSEY SCALE

Below are the values for the Kinsey Scale:

0- Exclusively heterosexual with no homosexual

1- Predominantly heterosexual, only incidentally homosexual

2- Predominantly heterosexual, but more than incidentally homosexual

3- Equally heterosexual and homosexual

4- Predominantly homosexual, but more than incidentally heterosexual

5- Predominantly homosexual, only incidentally heterosexual

6- Exclusively homosexual

APPENDIX F

DEBRIEFING DOCUMENT

Research Participant:

During this study, you were asked to answer a series of questions in an interview, as well as read two short passages. You were told that the purpose of the study was to investigate stereotypes about the gender socialization of LDS returned missionaries. Socialization is a process in which "individuals are assisted in becoming members of one or more social groups" (Grusec & Hastings 2007:p. 1). Early childhood socialization in fact allows individuals to form habits and norms that carry on into adulthood and can be expressed through behavior and speech. Some of the habits and norms help others form opinions about that individual. This study will attempt to investigate the correlation of these perceptions about an individuals behavior, based on their gender socialization as a pre-adolescent and adolescent, with their speech and others perception of their speech.

The actual purpose of the study is to investigate the gender socialization of those who grow up to sound stereotypically gay or straight. I am also investigating which phonetic cues individuals use to judge a voice as sounding stereotypically gay or straight. In order to do this, I will analyze the recording I made during the interview and may use portions of it in a listening task. Your name and identity will not be made known. Your speech sample will be mixed with other speakers speech samples. I did not tell you the real purpose of the study because I wanted you to speak as naturally as possible during the interview and when you read the two passages.

If you have any questions, concerns, or complaints or if you feel you have been harmed by this research please contact Derron S. Borders, Department of Linguistics, University of Utah, [number has been removed for publication].

I would like to remind you that your participation in this research is completely voluntary. It is up to you to decide whether or not to continue participating in this study. If you decide to withdraw from the research at this time, I will destroy any data collected about you during this study. The decision to withdraw from this research will involve no

penalty or loss of any benefits to which you are otherwise entitled. This will not affect your relationship with the investigator. If you would like to withdraw from this study, please let the investigator know.

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns, which you do not feel you, can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

Again, please accept my appreciation for your participation in this study.

APPENDIX G

LANGUAGE ATTITUDES AND PERCEPTION EXPERIMENT

G.1 Welcome Page

G.1.1 Page 1

Welcome to the Utah LDS Attitudes and Perception Experiment. In order to take part in this experiment, you must be 18 years of age or older. You will also need about 45 minutes to a complete hour, you cannot start the experiment and come back to it later. This experiment works best using high speed internet and the following web browsers: Chrome, Firefox, and Safari. If you are not using one of these browsers or your internet speed is too slow, it is not guaranteed that you can take part in the study. This experiment relies heavily on audio, so you will need to use a pair of working headphones or earbuds. After you have connected your headphones and have inserted them into your ears, you may click next to go to the consent page.

G.2 Head phones

G.2.1 Page 2

Have you connected you headphones/earbuds? You may not proceed until you have verified that you have connected your headphones or earbuds and have put them on/in. Please push play on the audio player below to hear a tone. Verify that you heard the five second tone. If not, troubleshoot (make sure the headphones are working and are plugged in correctly and that your computer recognizes them) and play the tone over until you can hear it. Once you have, hit "yes."

- Yes
- No

G.2.2 Page 3

[If they answered no on the previous page, they were presented with the following]

YOU MUST USE WORKING HEADPHONES OR EARBUDS TO PARTICIPATE IN THIS STUDY! PLEASE DO NOT CONTINUE IF YOU HAVE NOT PUT ON YOUR HEADPHONES OR YOUR EARBUDS! Thank you!

G.3 Consent

G.3.1 Consent Cover Letter

G.3.2 *LDS Socialization and Opinions*

The purpose of this study is to investigate stereotypes about the gender socialization of LDS men. Socialization is a process in which individuals are assisted in becoming members of one or more social group (Grusec & Hastings 2007). Early childhood socialization in fact allows individuals to form habits and norms that carry on into adulthood and can be expressed through behavior and speech. Some of the habits and norms help others form opinions about that individual. This study will attempt to investigate the correlation of these perceptions about an individual's behavior, based on their gender socialization as a pre-adolesent and adolescent. We hope the information we get from this study may help develop a greater understanding of stereotypes about gender socialization and how it relates to people forming opinions about individuals in the future.

As part of this study you will be asked to answer a series of questions on a survey. Each question will contain a 10 second audio clip of a male voice. After listening to the audio clip a series of characteristics will appear on the screen. You will be asked to choose the characteristic that best matches the voice that you heard on the audio recording.

The researcher will keep all records that identify you private to the extent allowed by law. All electronic data will be saved behind a password protected SurveyGizmo account and backed up on hard drives that will be encrypted and password protected.

You will be anonymous except in cases where the researcher is legally obligated to report specific incidents. However, if you disclose actual or suspected abuse, neglect, or exploitation of a child, or disabled or elderly adult, the researcher or any member of the study staff must, and will, report this to Child Protective Services (CPS), Adult Protective Services (APS) or the nearest law enforcement agency.

There are some cases in which a researcher is obligated to report issues, such as serious threats to public health or safety.

If you have questions, complaints or concerns about this study, you can contact **Derron Borders** at [number removed for pubication] or [e-mail removed for publication]. If you

feel you have been harmed as a result of participation, please contact **Marianna Di Paolo** at [e-mail removed for publication] who may be reached 24 hours a day.

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns which you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by email at irb@hsc.utah.edu.

Research Participant Advocate: You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by email at participant.advocate@hsc.utah.edu.

COSTS AND COMPENSATION TO PARTICIPANTS

There are no foreseeable costs in participating in this study.

By participating, you have the chance to enter into a drawing for one of four $20 Amazon gift cards to compensate you for your time.

It It should take less than one (1) hour to complete the questionnaire. Participation in this study is voluntary. You can choose not to take part. You can choose not to finish the questionnaire or omit any question you prefer not to answer without penalty or loss of benefits.

By clicking"Next," you are giving your consent to participate.

Thank you so much for considering participating in this study, your responses are very important!

G.4 Gift card

G.4.1 Page5

On the next page you will have the chance to enter your e-mail. This will be used to contact you about whether or not you won one of four $20 Amazon Gift cards. You will hear about whether or not you have won around the beginning of January, 2014.

G.5 Instructions page

G.5.1 Page 7

On the following pages, you will be presented with short audio samples of participants from a previous study. There will be 14 audio samples across three different sections.

You will have a one-minute break between each section and a reminder of the task at hand.

After each audio sample there will be a list of 10 characteristics, listed in pairs on a six point scale. You will be asked to choose a point on the scale which best describes the voice which you heard, such as:

sounds definitely x

sounds somewhat x

sounds in between

sounds somewhat y

sounds definitely y

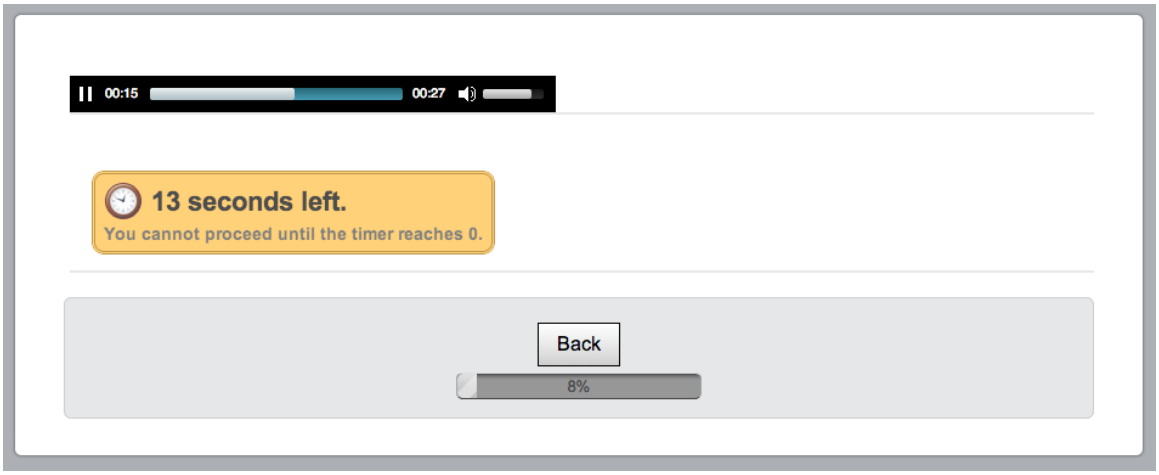
not sure

You will have twenty (20) seconds to complete the judgment tasks.

There will be two practice questions at the beginning of the study. Once you are ready, click next and you will be presented with a page that marks the beginning of the experiment.

G.6 Audio example page

[Below is a screen shot of what a page where listeners listened to the audio looks like.]



G.7 Judgment task example page

[Timer for 20 seconds here]

1. Describe the person you heard on the previous page.

Sounds definitely gay

Sounds somewhat gay

Sounds in between (gay and straight)

Sounds somewhat straight

Sounds definitely straight

2. Describe the person you heard on the previous page.

Sounds definitely polite

Sounds somewhat polite

Sounds in between (polite and rude)

Sounds somewhat rude

Sounds definitely rude

3. Describe the person you heard on the previous page.

Sounds definitely educated

Sounds somewhat educated

Sounds in between (educated and uneducated)

Sounds somewhat uneducated

Sounds definitely uneducated

4. Describe the person you heard on the previous page.

Sounds definitely feminine

Sounds somewhat feminine

Sounds in between (feminine and masculine)

Sounds somewhat masculine

Sounds definitely masculine

5. Describe the person you heard on the previous page.

Sounds definitely Mormon

Sounds somewhat Mormon

Sounds in between (Mormon and non-Mormon)

Sounds somewhat non-Mormon

Sounds definitely non-Mormon

APPENDIX H

SPSS SYNTAX

Below is the syntax that was used to get the results in Table 4.1 and 4.1.

```
BOOTSTRAP
  /SAMPLING METHOD=SIMPLE
  /VARIABLES TARGET=Judgment INPUT=Orientation Style GenderSocialization
  /CRITERIA CILEVEL=95 CITYPE=PERCENTILE  NSAMPLES=1000
  /MISSING USERMISSING=EXCLUDE.
MIXED Judgment BY Orientation Style WITH GenderSocialization
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
SINGULAR(0.000000000001) HCONVERGE(0,
    ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED=Orientation Style GenderSocialization | SSTYPE(3)
  /METHOD=REML
  /PRINT=SOLUTION
  /RANDOM=INTERCEPT | SUBJECT(Speaker) COVTYPE(VC)
  /RANDOM=INTERCEPT | SUBJECT(Listener) COVTYPE(VC)
  /EMMEANS=TABLES(Orientation) COMPARE ADJ(BONFERRONI)
  /EMMEANS=TABLES(Style) COMPARE ADJ(BONFERRONI).
```

Below is the syntax that was used to get the results in Table 4.7.

```
BOOTSTRAP
  /SAMPLING METHOD=SIMPLE
  /VARIABLES TARGET=Judgment INPUT=Orientation Style HighestAverageFrequency
 AverageSpectralSkew
  /CRITERIA CILEVEL=95 CITYPE=PERCENTILE  NSAMPLES=1000
  /MISSING USERMISSING=EXCLUDE.
MIXED Judgment BY Orientation Style WITH HighestAverageFrequency
```

```
 AverageSpectralSkew
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
  SINGULAR(0.000000000001) HCONVERGE(0,
    ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED=Orientation Style HighestAverageFrequency AverageSpectralSkew | SSTYPE(3)
  /METHOD=REML
  /PRINT=SOLUTION
  /RANDOM=INTERCEPT | SUBJECT(Speaker) COVTYPE(VC).
```

Below is the syntax that was used to get the results in Table 4.6.

```
BOOTSTRAP
  /SAMPLING METHOD=SIMPLE
  /VARIABLES TARGET=Judgment INPUT=Orientation Style AverageHighestAmp
 AverageSpectralSkew
  /CRITERIA CILEVEL=95 CITYPE=PERCENTILE  NSAMPLES=1000
  /MISSING USERMISSING=EXCLUDE.
MIXED Judgment BY Orientation Style WITH AverageHighestAmp
  AverageSpectralSkew
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
  SINGULAR(0.000000000001) HCONVERGE(0,
    ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED=Orientation Style AverageHighestAmp AverageSpectralSkew | SSTYPE(3)
  /METHOD=REML
  /PRINT=SOLUTION
  /RANDOM=INTERCEPT | SUBJECT(Speaker) COVTYPE(VC).
```

Below is the syntax that was used to get the results in Table 4.5.

```
BOOTSTRAP
  /SAMPLING METHOD=SIMPLE
  /VARIABLES TARGET=Judgment INPUT=Orientation Style AverageSpectralCOG
 AverageSpectralSkew
  /CRITERIA CILEVEL=95 CITYPE=PERCENTILE  NSAMPLES=1000
  /MISSING USERMISSING=EXCLUDE.
MIXED Judgment BY Orientation Style WITH AverageSpectralCOG
```

```
AverageSpectralSkew
 /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1)
 SINGULAR(0.000000000001) HCONVERGE(0,
   ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
 /FIXED=Orientation Style AverageSpectralCOG AverageSpectralSkew |
  SSTYPE(3)
 /METHOD=REML
 /PRINT=SOLUTION
 /RANDOM=INTERCEPT | SUBJECT(Speaker) COVTYPE(VC).
```

APPENDIX I

PRAAT SCRIPT

```
resultfile$ = "results.txt"
header_row$ = "SoundFile" + tab$ + "Prev" + tab$ + "Word" + tab$ + "Next" + tab$
+ "Segment" + tab$ + "DurationMS" + tab$ + "HighestFreq1" + tab$ + "HighestAmp1"
 + tab$ + "SpectralCOG1" + tab$ + "SpectralSkew1"+ tab$ + "HighestFreq2" + tab$ +
 "HighestAmp2" + tab$ + "SpectralCOG2" + tab$ + "SpectralSkew2"+ tab$ +
 "HighestFreq3" + tab$ + "HighestAmp3" + tab$ + "SpectralCOG3" + tab$ +
  "SpectralSkew3" + newline$
fileappend "'resultfile$'" 'header_row$'
endif
sn$ = selected$ ("Sound")
select Sound 'sn$'
select TextGrid 'sn$'
numint = Get number of intervals... 2
for i from 1 to numint
select TextGrid 'sn$'
label$ = Get label of interval... 2 'i'
if label$ <> ""
start = Get starting point... 2 'i'
end = Get end point... 2 'i'
midpoint = start + ((end - start) / 2)
select TextGrid 'sn$'
wordint = Get interval at time... 1 'midpoint'
               prevint = wordint - 1
nextint = wordint + 1
select TextGrid 'sn$'
prevlab$ = Get label of interval... 1 'prevint'
```

```
wordlab$ = Get label of interval... 1 'wordint'
nextlab$ = Get label of interval... 1 'nextint'
# Get 1/3 point
p1 = start + ((end - start) / 3)
p2 = midpoint
p3 = start + (2*((end - start) / 3))
duration = (end - start) * 1000
durationms = (end - start)

result_row$ = "'sn$'" + tab$ + "'prevlab$'" + tab$+ "'wordlab$'" + tab$
+ "'nextlab$'" + tab$ + "'label$'" + tab$ + "'durationms'"
fileappend "'resultfile$'" 'result_row$'

tp = p1
tpn = 1
call peakmeasure
result_row$ = tab$ + "'peakmeasure.storedf'" + tab$ + "'peakmeasure.storeda'"
+ tab$+ "'peakmeasure.cog'" + tab$ + "'peakmeasure.skew'"
fileappend "'resultfile$'" 'result_row$'

tp = p2
tpn = 2
call peakmeasure
result_row$ = tab$ + "'peakmeasure.storedf'" + tab$ + "'peakmeasure.storeda'"
+ tab$ + "'peakmeasure.cog'" + tab$ + "'peakmeasure.skew'"
fileappend "'resultfile$'" 'result_row$'

tpn = 3
tp = p3
call peakmeasure
result_row$ = tab$ + "'peakmeasure.storedf'" + tab$ + "'peakmeasure.storeda'"
 + tab$ + "'peakmeasure.cog'" + tab$ + "'peakmeasure.skew'"
fileappend "'resultfile$'" 'result_row$'
```

```
result_row$ = newline$
fileappend "'resultfile$'" 'result_row$'
endif
endfor

procedure peakmeasure

.storeda = 0
.storedf = 0
select Sound 'sn$'
Edit
editor Sound 'sn$'
Spectrogram settings... 0 15000 0.05 50
Move cursor to... 'tp'
View spectral slice
Close
endeditor

slice$ = selected$ ("Spectrum")
select Spectrum 'slice$'
.cog = Get centre of gravity... 2
.skew = Get skewness... 2
select Spectrum 'slice$'
To Ltas (1-to-1)
ltas$ = selected$ ("Ltas")
select Ltas 'ltas$'
numbins = Get number of bins
for b from 1 to numbins
ba = Get value in bin... 'b'
bf = Get frequency from bin number... 'b'
if bf > 1000
if ba > .storeda
.storeda = ba
.storedf = bf
```

```
endif
endif
endfor

select all
minus Sound 'sn$'
minus TextGrid 'sn$'
Remove

endproc
```

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